Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME IX.] NEW-YORK SEPTEMBER 9, 1854. [NUMBER 52,

THE SCIENTIFIC AMERICAN, PUBLISHED WEEKLY.

At 128 Fulton street, N. Y. (Sun Buildings.)

BY MUNN & CO.

Agents.

Fedelsen & Co., Boston. | Dexter & Bro. New York
Stokes & Bro., Philadelphia. | B. Dawson, Montreal, C.E
Cook, Kinney & Co., San Francisco. | M. Boullemet, Mobile, Ala
Le Count & Strong, San Francisco. | E. W. Willey, New Orleans
Avery Bellford & Co., London | E. G. Fuller, Halifax, N. S
S. G. Courtenay, Charleston, | M.M.Gardissal & Co. Paris
H. Taylor, Baltimore, Md. | E.W. Pease, Cincinnati, O

Responsible Agents may also be found in all the principal cities and towns in the United States.

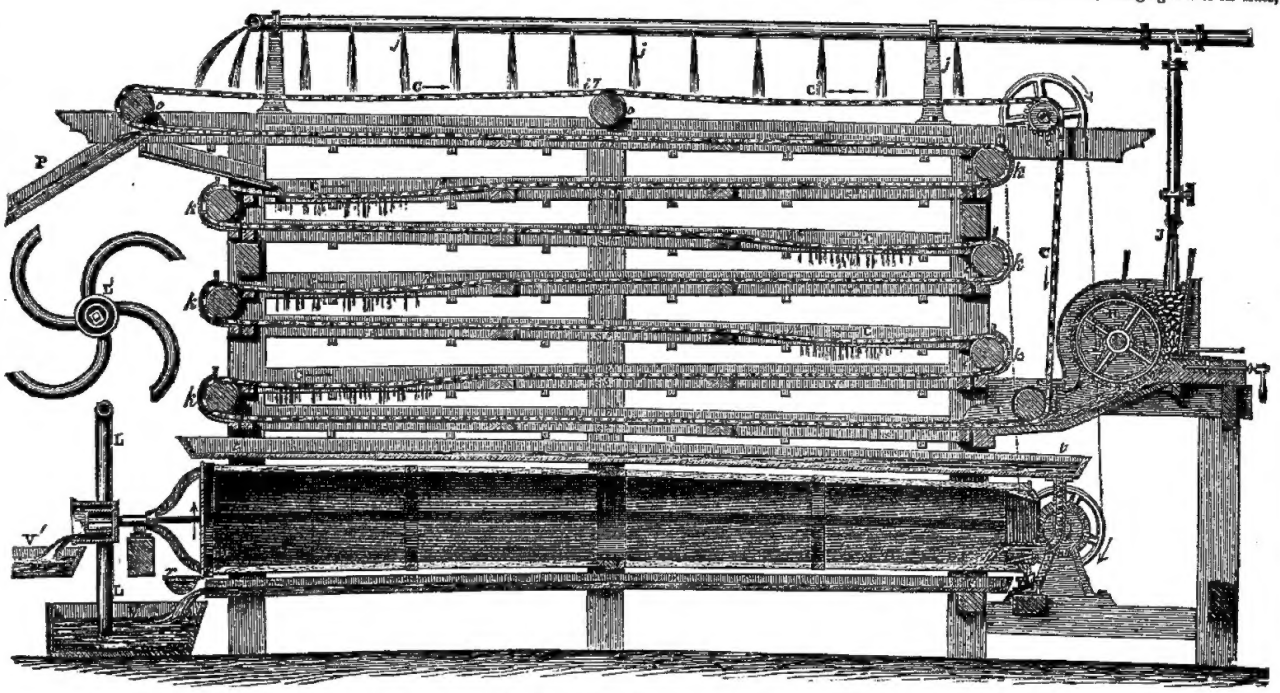
TERMS—$2 a-year:—$1 in advance and the remainder in six months.

FRENCH POTATO STARCH MACHINE.

Owing to the failure of the potato crops in so many parts of our country during the past three years, this tuber has not been so extensively used for making starch; corn starch has supplanted it. But as the corn crop is said to be a failure in so many parts of our country this year, and as so many potatoes for years past, after having been gathered apparently sound, have commenced to rot, we think it no more than a wise precaution to use many of them in the manufacture of starch, when the crops are good, and where they cannot conveniently be carried to distant markets.

We here present a longitudinal vertical section of the machine which is employed in France for preparing potatoe starch, and although it is one made on a large scale for extensive manufacturing establishments a small one can equally well be constructed for any manufactory, according to its business. Our object principally is to direct attention to the subject, the more especially as there are many other tubers now wild and never used, of which good starch can be made by the same process as that for making potato starch.

The first process is to soak the potatoes in water for about six hours, this softens the skin and assists in its removal; they are then passed through a hopper into a cylindrical cage, and washed by revolving the cage in a trough of water, a stream falling on the cage; all the earthy matter and much of the skin are thus removed. The potatoes are then fit to be placed in the rasping machine, here represented. R is a rasp cylinder having toothed knives, or saws in its circumference, and made like "Parkhurst's Gin." This rasp cylinder moves at a high velocity, in the hopper, H, which is so contrived that by hanging one of its sides,



s, upon an axis near the top, and keeping the lower part of the same side pressed in towards the rasp, it will yield, if a stone should get into the hopper. A stream of water, J, falls upon its surface, and assists the centrifugal action of the rasp in clearing its surface of the pulp, which passes down a trough, T, and thence to a series of wire gauze sieves, or strainers, mounted in fixed frames, one above the other. The pulp is first passed over the sieve, s', and then raised and passed over the other sieves, s^2, to s^6, by scrapers attached to an endless articulated chain, C C, moving on rollers, c c. There are two of these chains, one on each side of the sieves, only one is shown. K K is a box on the rollers, c c. Jets of water constantly play on the top sieve frame, and it trickles down through all the others, and by the time the pulp arrives at the discharging spout, P, it is thoroughly washed. The water charged with the fecula, is received in the trough, t, and then passed into the cylindrical sieve, D, of fine wire gauze, which is kept revolving on a shaft. Here the remaining portion of the fibrous part of the starch cells, which escaped separation by the sieve frames, are separated from the real starch. This fine pulp is collected in the small vat, r, while the starch water passes into a trough, t', and then into a vat, V, from which the centrifugal water filter, L, (separate figure) revolving on the axis of D, raises it into the trough, V', from which it runs into the depository vats. The wire gauze of the frame, s', s^2, &c., increases in fineness from the top. At each stage are plates of galvanized iron curved so as to retain a portion of the water from the jets, j j, and thus act as a momentary stop for the pulp in its passage across the sieve frames; this prevents the pulp from forming into knots.

The starch water is received into clean wooden depositing vats from V, when it soon deposits the starch at the bottom; the clean water is then run off and the starch put upon cloths to drain, these being contained on trays with perforated bottoms. These are placed on floors of well dried plaster of Paris, which in twenty-four hours absorbs the moisture, after which it is broken up in lumps, and placed on shelves in a drying house. The pieces are turned over occasionally, and when they begin to crack the drying is completed at a hot stove, about 136°. When dry, it is batted through a fine sieve. [Red potatoes contain the most starch—about eighteen per cent.] Potatoes may be kept for a year or more at the temperature of freezing water, without losing starch. Small potatoes contain most starch. If germinating potatoes are used for making starch, cattle must not be fed on the residue, as is done with firm ripe potatoes, as the shoots of germinating potatoes contain *solanine*, a poisonous substance, which will paralyze their limbs. Potatoes for making starch should not be allowed to ferment, as this action leads to a great loss of starchy matter.

Starch is not soluble in cold water, but it is in hot.

Civil Superintendence at the Armories.

The administration has carried into effect the recent law of Congress, and removed the military superintendents of the armories at Springfield and Harper's Ferry. Erskine S. Allen, of Springfield, is appointed acting superintendent of the establishment there, and William Byington at Harper's Ferry. These gentlemen were the master armorers under the military system. The old system of employing military superintendents was a source of continual disturbance between them and the workmen, who being independent mechanics, were not disposed to submit to a military discipline.—[Philadelphia Ledger.

Locomotive on a Table.

An ex-postmaster of Boston is in Germany, and sends home an account of a dinner to a railway congress, at which a locomotive appeared upon the table, to which was attached a train loaded with dishes of the choicest and most solid food. The succulent train advanced slowly, in imitation of the passenger trains upon all German roads. After having made the tour of the table without stopping; in order to give a view of the good things with which it was freighted, the train again started, making a station in front of each guest, and permitting him to fill his plate according to his appetite and fancy.

Light by Electricity.

M. Regnault, Director of the Rouen telegraph, in France, has produced light by electricity for four consecutive months, for the Napoleon Docks, accommodating 300 workmen. His report of the experiment is interesting. Two large sized batteries were used, the expense of each being per evening—wages of workmen 4·50f.; mercury 5f.; zinc 4·50; charcoal points 1·20; nitric acid 1·80; sulphuric acid 1·84—making 19·04 francs per battery: or $7,62 per evening for both batteries, or about one mill per man. The work can be done without danger. The report remarks that electro-lighting can be cheaply established on ship board, and is not like other lights liable to be extinguished in a storm.

So far as it goes, the report is satisfactory, but if we had the price of the apparatus, not the mere waste of metals, charcoal, and acid, and the expense of keeping it in order before us, we might form a more substantial idea of its economy, in comparison with gas. We do not believe that light by the burning of charcoal points by electricity can be produced as cheaply as from gas.

The next number of the "Scientific American" will contain several fine engravings of different mechanical subjects.

New Inventions.

Tempering and Flattening Saws.

William Clemson, of Boston, Mass., has made an important improvement under the above head. It consists of two iron plates placed horizontally one above the other, these plates being heated over a suitable fire-place. The tempering and flattening of the saw are effected simultaneously, by drawing the saw between the heated plates. As the saw passes between, it absorbs sufficient heat from the plates to effect the necessary tempering, while the flattening is done by the pressure of the upper plate. When a saw has been previously hardened it requires to receive a certain degree of heat before passing through the plates; if not sufficiently heated, it will break during the process. On the other hand, if too hot, it will spring back to its original unevenness after having been drawn through. To prevent this, the edges of the plates where the saw enters are beveled in such a manner, that before the saw arrives between them, every part of it becomes heated by radiation. The usual steps to secure a patent have been taken.

Instrument for Measuring the Speed of Ships.

This is the invention of John De Graw, of New York city. It consists in placing a tube extending down below the surface of the water, upon the outside of the vessel. The lower end of the tube is furnished with a piston, beneath which is an aperture having a flaring mouth piece. The water rushes through the mouth piece and lifts the piston to a hight proportionate to the speed of the ship. The piston is connected with an index located in some convenient position, whereby the apparent velocity of the vessel is at all times exhibited to the eye, in miles. An opening is made in the tube, both above and below the piston, through which the fluid enters; so that whether the density of the water at the base of the tube is increased or diminished, the pressure on the piston is equalized; the only operating force being that derived from the entrance of the water through the flaring mouth piece.—Measures have been taken to secure a patent.

Self-Setting Rat Trap.

L. A. Harper, of Russellville, Kentucky, has taken measures to secure a patent for the above invention. It consists in arranging a tilting decoy passage, and with it combining a drop door, which is operated by a spring trigger, in such a manner that as soon as the animal touches the bait, he is caught, and his weight made use of to set the trap for another customer. The passage into which the animal first enters, has the cellar floor for a bottom, so that the odorific senses of the rat are not likely to be offended when he approaches the bait.

New Butter Worker.

This consists in placing the butter within an endless sack or bag, which revolves between fluted rollers, in such a manner that the butter is constantly being operated upon by the rollers. One portion of the sack passes through water, whereby the butter is washed as often as desirable, during the operation. Ezekiel Gore, of Bennington, Vermont, is the inventor. Steps to secure a patent have been taken.

Daguerreotypes Attached to Monuments.

George R. Willmot, of Meriden, Ct., has taken measures to secure a patent for an improved method of attaching daguerreotype plates to monuments. The daguerreotype is placed within an air-tight box, having an ornamented front, and the box is then secured in an aperture made for the purpose, in the side of the monument. A convenient slide, upon the exterior, serves as a protection from the weather and also to exclude light, and thus preserve the picture from injury.

To Correspondents.

We have no room to devote to you this week, as the index, which is valuable, takes up a great part of the paper. In the next number we shall attend to your wants.

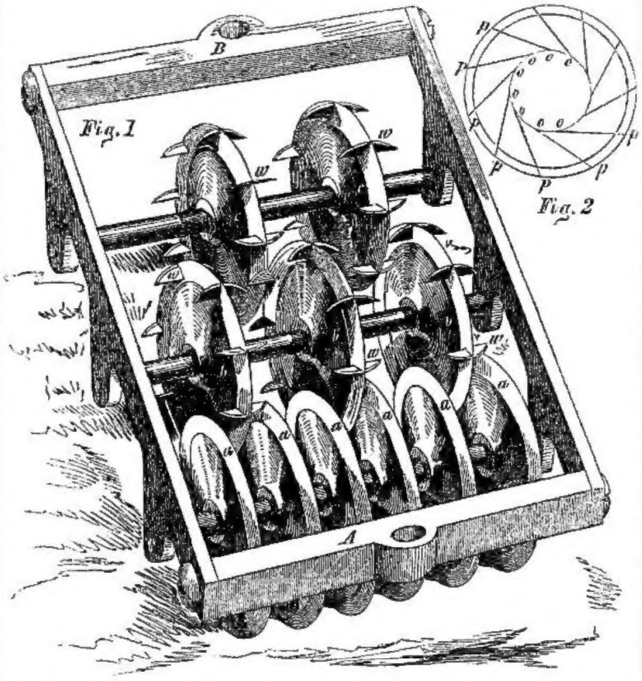
IMPROVED ROTARY CULTIVATOR.

The annexed engravings represent an improved Rotary Cultivator, the invention of H. M. Johnson, of Carlisle, Pa., for which Letters Patent were granted June 27, 1842.

Fig. 1 represents the machine in perspective, and fig. 2 represents a section, the nature of which will be shown in the following description:—

It is only within the past three or four years that this class of agricultural implements has appeared to dispute the ground so long occupied by the ordinary cultivator in general use; and in England where so much attention is be stowed upon this important branch of industry, we notice the very general introduction of the Rotary Cultivator. This improvement seems to present some advantages which are worthy of attention, and to render it more clear to the general reader we will describe its construction.

The frame, A B, supports three sets of colter or toothed wheels; the first set, *a a*, are merely circular rotary colters, and are made of the usual plow steel, or other substantial metal, as thin as is consistent with due strength, they are beveled to an edge, and at the periphery are slightly thicker than in the interior part, to lessen friction. Their distance apart may vary to suit the soil intended to be cut through.



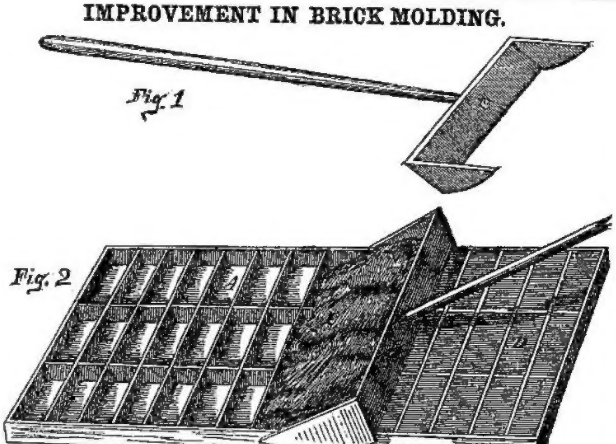
The second and third sets, *b b* and *c c*, are so placed as to come alternately in the center of the sections made by the first set, and consist of a colter precisely like those of the first set, *a a*; their edges are set with wings or knives, *w w*, projecting laterally at such an angle that, as the wheel revolves and advances, they descend edgewise with the least practical resistance, and come up flat-wise, bringing up the earth from the bottom of the cut.

The inclination of these knives, and the effect of their position is shown in fig. 2, in which the lines, *o p*, show the direction of the plane of the knives, and their length is equal to the space between the colter, *a a*, so as to cut up all the earth as the machine passes over it.

The advantage of the circular form of knife is, that all hard substances, such as loose stone, are pressed one side, and they are made adjustable, so that if one breaks it may be conveniently replaced. The patent provides for an increase of the colters or wheels, and also for the attachment of the cultivator to a carriage, whereby it may be raised and lowered at pleasure when formidable obstacles are presented, and each colter or wheel may have a separate axle, and play up and down under the pressure of a weight or spring, thus readily adjusting itself to uneven surfaces.

Our readers will find the claim published on page 342 of this volume, and for more information in regard to rights, etc., apply to the patentee as above.

IMPROVEMENT IN BRICK MOLDING.



The annexed engravings illustrate a new mode of molding bricks, for which a patent was granted on the 20th of June, 1854, to Nathan Johnson, of Noblesville, Hamilton Co., Ind.

The nature of this invention consists in providing a frame, seen in figure 2, which is divided off into compartments, A, each the size of the brick. This frame has neither top nor bottom, it is laid down upon the level surface of the brick yard, and the compartments then dusted, preparatory to the reception of the clay. The mortar, which is first tempered so thin as to make what is usually termed *slop*, or water brick, is then brought in wheelbarrows to one end of the frame and thrown upon the same. The operator then takes the "lute,"—shown separately in fig. 1, and represented by B in fig. 2,—and pushes the mortar, O, along over the compartments, which fill up as fast as the lute progresses, leaving the compartments filled as shown at D. The lute, as it passes along, strikes off all the superabundant mortar, leaving the molds evenly and fairly filled. After the operation is completed the molds are not to be disturbed until the bricks become loose, which generally requires three or four hours, depending somewhat upon the state of the weather. As soon as the molded bricks are sufficiently loose, the molds are lifted carefully off, placed in another part of the yard, and the operation repeated as often as desirable.

The inventor claims that he can mold bricks in this manner, which, when burned, are equal if not superior in quality to any of the best machine-pressed bricks. He states that he has tested the plan thoroughly. It certainly is a cheap and rapid way of molding.

Any further information may be obtained by addressing the inventor as above.

A Hot Air Locomotive.

The St. Louis "Democrat" says: "We understand that the Ohio and Missisippi Railroad Company have ordered a locomotive to be constructed, which shall be propelled by *hot air* on an entirely new principle. Should this experiment meet with success, the use of the tender will be entirely dispensed with, and coal sufficient to take the machine to Cincinnati can be carried in a single barrel. We cannot too highly commend this Company for the enterprise which induces them to make the experiment. Railroad Companies have heretofore very strangely rejected all improvements which have been brought up and proposed for the greater perfection of the locomotive, and thus the engine now in use is the very same, with a few inconsiderable exceptions, as that first made by Stephenson years and years agone. If the experiment of this influential and enterprising Company should meet with success, it will create a revolution in propulsion such as must astonish the world, and entitle the Ohio and Missisippi stockholders to the greatest honors."

[If the stockholders of the Ohio and Missisippi Railroad will take our advice—and we think we understand this subject in all its bearings—they will abandon the "hot air" project, and thus wisely save their money for a better purpose. The magnificent failure of the "Ericsson" ought to be a warning to all on this subject. We are friendly to all experiments, but really we cannot encourage such stupendous nonsense as is here betrayed. Let the experiments be devoted to improved coal burning locomotives for generating steam, and let "hot air" alone, and the result will be much more satisfactory.

Improved Rocking Chair.

By this invention, a complete rocking-chair is so formed that when not required for use it may be folded up and packed away in a trunk, or it may be extended to form a comfortable couch. Abel Russell, of Brooklyn, N. Y., is the inventor, and has taken the necessary steps to secure a patent.

Sub-Marine Telegraph.

The Halifax "Colonist" learns that the submarine cable forming part of the line of telegraph connecting Nova Scotia and New Brunswick with Prince Edward's Island, has been parted about two miles from the N. S. shore, and is doubtful whether it can be repaired the present season. It is also said that the idea of connecting Newfoundland with Prince Edward's Island by sub-marine cable has been abandoned, and the connection with this continent, if accomplished, will now be direct from Cape Race to Nova Scotia, at or near Cape North to join the line of the Nova Scotia company.

Scientific American.

NEW YORK, SEPTEMBER 9, 1854.

The End of the Volume.

With this number closes the Ninth Volume of the "Scientific American," and its pages show abundant proof of the progress of invention during the past twelve months. No less than two hundred new inventions, requiring about seven hundred engravings, have been illustrated, besides a great variety of notices and collations from the published records of European Science and Art.

The engravings in our last three Volumes have been regarded as the finest specimens of wood cuts of machinery ever presented in any work,—this is independent of their value to our readers, which is unquestionably very great, as they include almost every variety of mechanical subjects—such as steam engines and boilers, water wheels, grist mills, lathes, agricultural implements, bridges, presses, and tools of almost every description, thus forming a valuable illustrated mechanical Encyclopedia.

In looking over its pages, the reader cannot fail to observe the great number of articles furnished by practical men, and when we speak in praise of the "Scientific American," we do not mean our own particular articles,—we are far more proud of the inventions and contributions which have sprung from the genius of the inventor and the workshop of the mechanic. The clicking of machinery and the mysterious operations of the chemical arts, are congenial to our taste; hence we naturally have an enthusiastic desire to extend this influence among our countrymen. The tendency is ennobling and keeps the mind above the more gross materialism of the age in which we live. This is one reason why we so often seek the influence of our readers in extending the circulation of the "Scientific American."

We could give the names of a great number whose latent genius was first stirred by its influence, and who, from working journeymen, have become manufacturers, and superintendents, and whose circumstances have been bettered a thousand-fold. If this ought not to encourage us to do our best, then we should be unfit to conduct any public enterprise.

To our intelligent corps of contributors we are under special obligations, which it would be ungrateful in us not to acknowledge.

We have received during the past year many congratulations for exposing errors in science—falsely so called—and schemes of a plausible character, calculated to mislead the public. This affords us pleasure, but in so doing we have only performed a simple duty. Unless we could feel a boundless freedom in criticising and exposing such schemes, we should not do our duty to the public, and certainly we have no wish to serve the people in any other capacity as journalists. Our responsibilities increase with our circulation, and like a balance wheel in a machine, happily our experience grows with those responsibilities. More labor, care, and means will therefore be devoted to make our next volume still more worthy of the confidence and support of the people.

Mortality among Mechanical Publications.

It is no easy matter to sustain a paper devoted to mechanics and inventions; of this we have had abundant evidence. At present, we remember some fifteen periodicals of this class, which have come and gone; viz., the "State Mechanic," "Mechanic's Advocate," and "Mechanic's Journal," Albany, N. Y.; "New York Mechanic," "Farmer and Mechanic," "Scientific Mechanic," "American Artisan," and the "Engineer," New York City; "American Cabinet," "Crystal Palace," Boston; and "Inventors Journal," Baltimore—all weekly publications. Of monthlies there have been, the "Eureka," "Mirror of the Patent Office," "Appleton's Mechanics' Magazine," and the "People's Journal," New York; besides three or four "American Mechanics," published in as many different places.

At present the "Scientific American" is the only weekly publication in this country devoted to mechanical and scientific subjects; and of the monthlies the "Old Franklin Journal," and the "Young Polytechnic" are the only representatives left. The "People's Journal" was issued at $1 per annum, and undoubtedly attained the largest circulation of any of these monthlies; this was owing to its extremely low price and the industry of its publisher, who could not have realized any satisfactory reward for his time and trouble, and gave it up, like a wise man, for a better business. The "Eureka" and the "Mechanics' Magazine," lived through three volumes before they were suspended, and it is reasonable to suppose that if they had been well supported they would not have been discontinued. A great deal of money has been wasted upon unsuccessful journals of this character, and the task of sustaining them is one of extraordinary difficulty, and requires money, talent, energy, tact, industry, and, above all, fearless honesty in dealing with the subjects brought forward for discussion. It is much to be regretted that so many scientific cotemporaries have dropped as it were into a brief fatality from which there was no rescue.

We have made these statements for the purpose of showing our readers the great necessity of their being equally interested with us in sustaining a paper devoted to American Inventions, Science, Manufactures, and Art. It is humiliating for any paper to appeal to a certain class for its support simply because it pretends to an advocacy of its peculiar interests without possessing the merit necessary to recommend it as such. No paper deserves to be supported irrespective of its own worth, no matter what its object may be. It is the duty, however, of every mechanic, to acquaint himself with what is transpiring in the way of improvements and inventions in all parts of the world, and this he cannot do unless he reads a paper devoted to this branch of literature.—When there is a good periodical of this kind published in any country, the mechanic who does not subscribe for and read it, stands in his own light. With respect to his business, he is just like a merchant who attempts to buy and sell stock without looking into a newspaper to know the state of the markets, and what is doing in the commercial world.

The Circulation of the Scientific American, A Word to Advertisers.

In commencing a new volume of the "Scientific American," we shall print weekly about 30,000 copies. Subscribers have already come in so briskly that we have a demand for 20,000 copies on the first number. This number is larger in proportion than former years at the commencement of the volume, from the fact that the subscribers to the "People's Journal" (which has suspended publication) are to be supplied with the "Scientific American," which of itself will augment our circulation nearly 8000. Last year we received within two months from the date of the first number, 7000 subscribers, all requiring the back numbers from the commencement of the volume, and many, we regret to state, could not be supplied, as the editions of the first numbers were exhausted before we were scarcely aware of it ourselves. This year we have calculated upon 10,000 subscribers after the first number is published—3000 more than last year—and we think we have reckoned upon a sufficient number for the demand. Still we cannot but admit our selfishness in hoping that the demand may exceed the supply. Having stated what our circulation is at present, and what the prospects are for its increase, we would state to advertisers, that in future advertisements will be inserted at a charge of 25 cents per line, each insertion, instead of 18¾ cents, as heretofore, and the amount payable in advance.

The increase of our circulation by the supplying of the subscribers to the "People's Journal," is sufficient in itself to warrant the increase of rates, and whatever number of subscribers we receive on volume 10 over the number on volume 9, will be so much clear profit to the advertisers, as they can calculate for themselves, and we expect, and have provided for 3000 extra for their benefit, and still hope for more.

Gas—Heating Houses.

The New York "Tribune" of the 18th inst., in alluding to some inventions that are wanted, says of gas:

"There is a point in connection with the subject which deserves attention by American inventors. We need a burner which shall regulate the flow of gas at the jet, and effectually prevent the escape of any gas without perfect combustion. A heavy pressure is always put on by the gas companies, causing nearly one half of the whole quantity to pass off unconsumed. Their business is to sell gas, ours to purchase it, but not any more than we can use. Yet under the present arrangement of gas apparatus, we are entirely at the mercy of the companies who sell it."

American inventors have already directed attention to this point, and if the "Tribune" will examine page 380, this volume of "Scientific American," the editor will find an account of a burner to effect this object. Other burners have also been invented to meet the desideratum here urged.

With respect to heating houses, the "Tribune" says:

"English mechanics are now suggesting the feasibility of supplying heat to dwelling houses as well as gas, and by the same agency, that is, the circulation of steam or hot water through metal pipes. Doubts have been cast on the possibility of using water or steam to this extent. Condensation of the steam is predicted as certain to occur before it has traveled any distance from the boiler. Some trials, however, seem to dissipate these doubts. A very satisfactory illustration of its feasibility is seen at the Pennsylvania Insane Hospital, near Philadelphia, and the proprietor of an extensive steam saw-mill at Burlington, New Jersey, has successfully conducted the waste steam from his engine through metal pipes laid underground, a distance of some 900 feet, into his dwelling-house, where it performs all the important parts of washing, boiling, and diffusing a gentle and equable temperature in every room into which the pipes are introduced."

We suppose that there are few woolen or cotton factories in our country but what are heated with steam. It is no new thing this; either heating buildings with steam or hot water. Both plans have been practiced for forty years at least. Count Rumford was the first person who devoted his attention to this subject, and we have seen a building heated with steam, which was planned by him and has been in use ever since. All the ferry steamboats are heated with steam during winter, and all the exotic vineries of our merchants in this city, are heated with hot water. We are glad, however, that the "Tribune" has directed attention to the subject at present, as the system, if it can be carried out for private dwellings, will be the means of effecting a great amount of good. But we also know that efforts have been made in this city for the past three winters to carry it out, and we are not indebted to mechanics on the other side of the water for such suggestions. To carry it out successfully, however, means must be provided for cooking as well as heating, in private dwellings.

The New Patent Bill—A Bad Provision in it.

We have received a copy of the new Patent Bill, with the amendments, and it gives us no small amount of pleasure to see that the committee of the Senate has proposed to strike out nearly every objection that we pointed out when commenting on it. There are still some very objectionable provisions remaining in it, which we commend to the serious attention of that committee. In section 28, it is provided that in equity, "it shall be competent for the court having jurisdiction of the cause to enquire into the damages sustained by the plaintiff, *either by reference to a master*, or by directing an issue to a jury." The words in italics should be struck out, they will create disturbances, if retained in the bill. Such a power puts the court in the place of the jury, and violates a well known principle of common law, which has been in force ever since the first patent law was made. We do not like it, and we are confident that the people will not like it. Such issues should always be left to a jury and not to an appointee of the court.

Unclaimed Models.

Upon taking an inventory of the models remaining in our office, which have been accumulating for the last nine years, we find that the number remaining in our possession amounts to about fifteen hundred.

These models have been sent to us by inventors from all parts of the United States. Some of these are beautiful specimens of workmanship, and are displayed upon shelves to ornament our office, and others are of no value whatever, and are packed away in promiscuous disorder. To those who value their models sufficiently to pay the expense of transportation, we would advise them to order their return, and we would further suggest that in writing for them they should specify particularly what the model is, how it is constructed, (for we may have several under the same title) and how it shall be sent, and we will box it free of expense, and deliver to any Express or transportation line in the city. After this notice, parties who fail to order their models returned to them within three months, must not complain if they are not afterwards able to obtain them, for the quantities now on hand, together with those daily received, are getting to be too numerous and occupy too much space to be year after year stored at our expense, and the most worthless ones we shall from time to time destroy, unless they are sent for within three or four months, after written to that their inventions are not patentable.

To Our Cotemporaries.

We are under renewed obligations for the many kind words spoken of us during the past year, and especially are we grateful for the flattering manner in which they have received the prospectus of our coming volume. It shall be our object to retain the confidence of the press, and although we may sometimes come in collision when discussing prominent scientific subjects, yet it is always with us a mere difference of opinion, and nothing more, and in no instance can we recall an interruption of the *entente cordiale* with any of our brethren of the press. Every respectable newspaper in the country has our warmest wish for its success, and for the favors extended to us we hope always to feel deeply grateful.

Gratuitous Subscriptions.

An institution in the city of Philadelphia, numbering five hundred members, requests us, through its Secretary, to send them the "Scientific American" as a gratuity—this may appear very incredible but it is nevertheless true. Now as we do not do business in this way, and failing to perceive any reason in the request, we must respectfully decline it.

We are often "bored" by just such applications—perhaps amounting in all to one hundred each year. Our terms are two dollars per annum, in advance, and we hereby give notice to all public institutions, that we shan't send the paper unless the *quid pro quo* is duly forthcoming, perceiving no reason why we should supply five hundred readers for nothing and at the same time refuse to do the same for one.

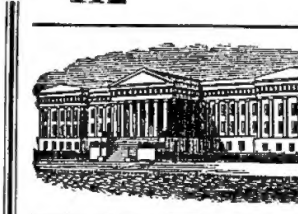
$570 IN PRIZES

The Publishers of the "Scientific American" offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

$100 will be given for the largest list,	
$75 for the 2nd.	$35 for the 8th,
65 for the 3rd,	30 for the 9th,
55 for the 4th,	25 for the 10th,
50 for the 5th,	20 for the 11th,
45 for the 6th,	15 for the 12th,
40 for the 7th,	10 for the 13th,
and $5 for the 14th.	

The cash will be paid to the order of each successful competitor; and the name, residence and number of Subscribers sent by each will be published in the "Scientific American," in the first number that issues after the 1st of January, so as to avoid mistakes.

Subscriptions can be sent at any time and from any post town. A register will be kept of the number as received, duly credited to the person sending them.



[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING AUGUST 29, 1854.

HOG PENS—R. M. Abbe, of Thompsonville, Conn. : I claim the swinging guard of the pen, in the manner set forth.

CULTIVATORS—Wm. T. Bassmore, of Bibb Co., Ga. : I claim the form of the hoes and the arrangement of the rods, by which arrangement the hoes are made adjustable and yet may be held stationary.

WASHING MACHINES—Wm. Biddle, of La Fayette, I nd. : I claim the combination of the vibrating bar, and vibrating wash board, with the lever described ; the vibrating wash board having its jointed attachment nearer to the center of motion of lever than the bar, so that in the motion of the lever back and forth, the clothes shall be griped and released between the board and bar, as set forth.

MAIZE HARVESTERS—G. A. Bruce, of Mechanicsburgh, Ill. : I claim the combination and arrangement of the oblique revolving cutters, revolving inclined directing shafts, bending and holding arms and inclined guides, as set forth.

SPIRIT LEVELS—Lebbeus Brooks, of Great Falls, N. H. : I do not claim the combination of a circular divided limb or plate and a spirit level with a bar or beam.

But I claim the combination therewith of an index bar, fix divided sectoral arc or limit, and its locking plate and spring catch, or the mechanical equivalents for such locking plate and catch, the whole being made to operate together as specified.

WINDOW BLIND HOLDER—E. W. Bullard, of Hardwick, Mass. : I claim a blind fastener constructed and operating as described ; the same consisting of the swivel box with its projection or harp turning freely upon, and when the blind is opened or closed, rigidly held by the angular rod, the said rod having a bearing upon which it swings in the projecting plate, as set forth.

FASTENING SKIRTS TO SADDLE TREES—J. C. Dickey, of Sandy Hill, N. Y. : I do not claim the combination of an elastic clamp plate with projections on the underside of a saddle tree for the purpose of fastening the skirt to the tree, and giving the saddle an adjustable bearing upon a horse, as in the case of Robert Spencer, patented Aug. 6th, 1850.

But I claim the combination of the teeth upon the elastic clamp plate, by which means it is held immovable in its position upon the leather with one or more screw or screws, or their equivalent, to draw the spring clamp plate and jockey plate together for fastening the skirt to the saddle tree, whether the jockey plate be adjustable or otherwise.

STAVE MACHINE—I. B. Dudrey, of Athens, Ohio : I claim the mode as set forth, of sawing logs or blocks both ways, by means of two circular saws so arranged and operated that the saws shall cut alternately in opposite directions, by being carried to and from the log or block as it moves back and forth, using thereby any well known mechanical means for effecting the same.

STAVE MACHINE—I. B. Dudrey, of Athens, Ohio : I claim the employment of two knives substantially of the form and action set forth within the curved jaws of a vibrating cutter head for cutting the staves both ways, that is, in the back and forth motion of the cutter head, all in the manner set forth, and in combination therewith I claim the curved guides or guards, for holding the stave when the same has passed the feed rollers, for the purposes set forth.

PLOWS—O. G. Ewings, of Heart Prairie, Wis. : I claim the jointed beam in combination with the adjusting screws, as described.

MANURE AND LIME SPREADERS—J. W. Fawkes, of Christiana, Pa. : I am aware that a perpendicular sliding diaphragm has been employed to rise or fall, and thus regulate the feed, and that fixed wires have been used both in the hopper and under the feed cylinders, therefore I do not claim any of these devices. Neither do I claim the rollers as such.

But I claim constructing the hopper with a swing diaphragm or dividing board, by which the material intended for spreading is prevented from arching.

I also claim the arrangement and combination of the moving breakers or pulverizers (actuated by the device described) with two rollers for the more effectual distribution of the contents of the hopper.

GUIDING CROSS CUT SAWS—E. Fanning, of Clarksfields Ohio : I claim, first, the hanging of the saw frame in the sash beam by means of a vertical slot, the curvilinear slot and the guides, in the manner described, so that a backward and forward movement of the saw in a direct line is effected in combination with the rocking movement of the same.

Second, the combination of the hand lever with the sash beam, for the purpose of regulating at pleasure the feed of the saw.

Third, the arrangement of the sash beam so as to be elevated or depressed by turning on a pivot or journal in combination with the movable frame sliding in the grooves, for the purpose of rendering the saw adjustable to and capable of operating upon logs or timber of any dimensions and in various positions, while at the same time the movement of the saw is always kept in a line with the direction of the pitman, whatever may be the site or position of the timber to be cut.

LEATHER SPLITTING MACHINE—J. F. Flanders and J. A. Marden, of Newburyport, Mass. : We claim the use of the continuously revolving cutter or endless belt knife as applied to machines for splitting leather and operating in the manner as set forth.

BEDSTEADS FOR INVALIDS—J. T. Forbes, of Coburg, Canada West. Patented in Canada Feb. 2nd, 1854 : I claim in combination with the arrangement of the shaft, gear and rack shafts, the rack with its attachments, by which the invalid can move the head and foot boards himself.

CAST HINGES—Nelson Gates, of Cincinnati, Ohio : I do not claim casting the hinge all at once without a pin by inserting in the mold blocks passing through certain of the sections of the knuckle and having concave recesses or convex projections to receive corresponding recesses or projections on the ends of the knuckle pieces, neither do I claim the employment of washers between all the joints of the knuckle when a pin is used in connection with such washers.

But I claim the employment within any number of joints in the knuckle of one or several metal washers which are of concave-convex or other form, which renders them capable without any assistance of serving as a pivot or center of the hinge, as set forth.

SLIDE VALVES FOR STEAM ENGINES—John Gleason, of Northfield, Vt. : I claim, first, the valve constructed as described, in combination with the cavities in the covering plate and the enlargement of the steam parts, as set forth

Second, in combination with the cavities in the covering plate and the passages in the valve, I claim the safety valve placed on the top plate for the purpose of allowing the steam to escape from the cylinder into the steam chest, when the pressure in the former exceeds that in the latter.

MANUFACTURE OF INDIA RUBBER—Daniel Hayward, of Providence, R. I. : I do not claim the curing of India rubber in its natural state when compounded with sulphur and lead, by the use of heat or of steam, nor do I claim the compounding of sulphur, white lead, or coal tar, with India rubber, all these having been the subjects of previous patents.

But I claim the improvement in the process of vulcanising native india rubber, or rubber once vulcanized, compounded with other articles, as set forth, which consists in heating and curing them with steam and under pressure, and in regulating the application of steam and the induration of the product by the introduction of steam and water, as described, by which a very great saving is made in the time and fuel required for the process, as stated.

SEED PLANTERS—S. M. Hockman, of Tonis Brook, Va. : I claim the inclined traversing or agitated screen, or its equivalent, to separate the refuse or other matter which is too large to pass through the openings which graduate the quantity spread upon the ground, and thereby prevent such openings from becoming choked.

I am aware that radial scores on a plane surface are described and represented in Francis Van Doren's patent of the 13th of April, 1852, therefore I do not claim radial scores on a plane surface.

But I claim making radial scores on a somewhat convex surface, so as to distribute the grain and manure more uniformly, as described.

MANURE EXCAVATORS—A. R. Hurst, of Harrisburgh, Pa. : I am aware that a device similar to the toothed bar has been employed in harrows and cultivators, and therefore I do not claim the same as used in such implements.

But I claim the combination and arrangement of the swinging toothed cross bar, carriage, and swinging stop bar, so as to form an instrument for excavating or loosening and separating the particles of manure with ease and facility, as described.

SEED PLANTERS—John H. King, Jr., of Georgetown, D. C. : I do not claim solid scatterers such as are used in the lime spreader of J. Hatch, patented Aug. 17, 1835, and also shown in the rejected application of M. D. Wells. Neither do I lay any claim to the use of slaves or screens above the hopper.

But I claim the employment of the adjustable scatterer, as described, for insuring the even distribution of the various seed and manures passed through the apparatus, as set forth.

LAMP FILLERS—C. R. Landmann, of New York City : I claim the use of the safety-filling apparatus, made and operating as set forth, in combination with a filler case.

DIES FOR MAKING AUGERS—E. L'Hommedieu, of Chester, Conn. : I am aware that the swaging of the lip and head of an auger by dies is not new ; when employed they have not formed the whole of the hollow or recess of the auger head, as what was below the shank afterwards had to be removed by a file or chisel. I therefore do not claim the mere employment of dies in such way, to swage out the lip and head of an auger, and a part only of the recess or cavity of the head.

But I claim the peculiar arrangement of the shank entrance of the matrix, that face of it against which the hollow surface of the auger head rests and is formed, and the male die which forms the hollow or recess of the head, the same enabling me to make an auger head not only with the whole of its recess stamped or formed by dies, but having its shank at the proper turning angle with respect to it.

HARROWS—John G. McCauley, of Stone Bridge, Va. : I claim constructing the double tooth as that one portion may operate on the ground and the other be in reserve, and also serve as a shank to confine the tooth to the beam in connection with the band and key.

BINDING FOLDER—John B. Nichols, of Lynn, Mass. : I claim the binding folder made to guide and fold, as described, whether used in connection with a sewing machine or with any other mode of fastening the binding after it is folded and applied.

PLOW FOR PLANTING POTATOES—Whitman Price, of Goldsborough, N. C. : I am aware that double mold-boards, and also mold-boards so curved as to somewhat dress the top of the furrow, have been used ; these devices, therefore, I do not claim.

But I claim the particular form of skimmer plate, in combination with the mold-boards, tree, and shovel, as set forth.

SEED PLANTERS—Wm. Redick, of Uniontown, Pa. : I do not claim any of the devices described when used separately or in any combinations of them other than represented.

But I claim the specific arrangement of the cams on the axle, the markers on the periphery of the carrying wheel and the valves at or near the bottom of the seeding tubes, with their several operative parts, for the purpose of causing regularity in the marking and dropping of the grain, regardless of the varied speed of the horses drawing the machine, as set forth.

RAW MILL DOGS—Titus H. Russell, of Taftsville, Vt. : I claim the device described to keep the hinges of the dogs tight, and thereby more effectually maintain the straightness of the saw kerf, and uniformity in the thickness of the lumber.

I also claim the construction of the slide which carries the dog of the head block with a broad platform to support the dog firmly against lateral pressure, and a long narrow arm to extend back of the saw race to the opposite end of the parallel guide rails of corresponding width, whereby the dog, while necessarily limited to a short support on that end of the head block on which it rests, by the supplementary slide arm seated as firmly on the block as if its slide could be made to extend across the saw race, thus avoiding the binding and other difficulties which have heretofore existed for want of length and firmness in the sliding dogs of the head blocks.

TENONING SPOKES—R. L. Ribbet, of Shippensburgh, Pa. : I do not claim the plane, for they have been previously used, or similar ones in joinery.

But I claim securing a series of spokes upon a board or plate provided with ledges or projections, adjustable gauge block, guide strip, cross-piece, cross bar, and block, all constructed as set forth.

CORN SHELLERS—A. J. Smith, of Piqua, Ohio : I do not lay claim to any of the parts of this apparatus except in their mutual application and relative construction, as combined.

But I claim the yielding guard board having its rear edge somewhat elevated and hinged to the frame, and resting by its front edge upon the rear portion of the shaking continuous carrier, so as constantly to fill the carrying interval between the said carrier and the shelling concave, for the purposes described.

VALVE FOR HYDRAULIC RAMS—J. C. Strode, of West Chester, Pa. : I claim the construction of puppet valves of hydraulic rams with the upper part of the valve sliding in contact with the sides of the valve chamber, and the part F and G made conical or tapering, in the manner described.

CHAIRS FOR EXERCISING—Joshua Stevens, of Chicopee Falls, Mass. : I do not claim arranging the seats of exercising chairs for young children upon springs, as they have been thus arranged heretofore.

But I claim a nursery chair for exercising, amusing, and weighing young children, having its parts arranged and operating, as described.

BREAST CUPS—Elisha Waters, of Troy, N. Y. : I claim connecting the chamber of the diaphragm pump with the breast cup by means of the curved exhaust tube, by which the said breast cup can be nearly filled with milk from the breast without allowing any portion of its contents to flow into the chamber of the pump, which prevents the necessity of frequently removing the cup from the breast whilst using the instrument, as set forth.

I also claim the arrangement of the said breast cup and curved exhaust tube, with the described diaphragm pump, as set forth, by which the patient is enabled to use the instrument without the aid of an assistant.

HORSE SHOEING APPARATUS—Noah Warlick, of Lafayette, Ala. : I do not claim the supporting of the horses hoof by a stand during the shoeing operation

But I claim the described head piece with the adjustable slide constructed and arranged, as set forth, for adapting the apparatus to hoofs of every size.

CUTTING TENONS.—Chas. P. S. Wardwell, of Lake Village, N. H. : I claim, first, the manner herein described of combining and arranging the squaring off saw, vertical shoulder saws, horizontal tenon saws, or horizontal saws and cutters combined, so as to constitute a machine which is capable of completing the tenon or tenons before the rail is discharged, for the purpose described.

Second, I claim the manner described of combining and arranging the saw arbor, or swinging frame, slotted segment lever, and set screw, for the purpose of facilitating the operation of adjusting the shoulder saws or tenoning saws, as described.

Third, I claim the employment of one or more cutters between the horizontal tenon saws, in combination with the shoulder saws, for the purpose of cutting two or more tenons on each end of the rail at one operation, as described.

HYDRAULIC RAM.—J. D. West, of New York City : I do not confine myself to the precise position of the rod as shown, for that may be differently arranged.

But I claim having two valves placed at the ends of a rod, the valves being fitted at the ends of passages which are connected by branch pipes to a main pipe leading from the spring or source, said valves being constructed and arranged, or in an equivalent way, and operating as set forth.

[COUNTER TWIST SPREDERS.—Jesse Whitehead, of Manchester, Va. : I claim the combination of the upper bobbin shaft with the curved, overlapping bobbin bars, arranged and operating as described.

NAIL MACHINES.—John Wootton, of Boonton, N. J. : I claim the two pairs of segmental rolls, combined, arranged, and operating so that the first pair brings the nail or spike nearly or quite to the desired form, and the second may complete it, and by the reversed position finish off the finned, teeth red, or ragged corners which were formed by the junction : the former rolls as set forth.

GOVERNOR FOR WINDMILLS.—Daniel Halladay, of Ellington, Conn. : I do not claim attaching the wings or sails to spindles which turn on their axis, irrespective of the arrangement for turning said spindles in order to give them the desired obliquity, and thereby presenting a greater or less surface to the wind.

But I claim attaching the spindles of the wings or sails to a sliding head by means of levers, or their equivalents, and operating said head by means of the lever or its equivalent, and a governor of any proper construction for the purpose of giving the desired obliquity to the wings or sails, and thereby ensuring an equal motion of power during the variable velocity of the wind.

FURLING AND UNFURLING WINDMILL SAILS.—Thos. C. Vice, of Rochester, N. Y. : I claim the clothing and unclothing of windmills while the vanes thereof are in motion or at rest, by means of an iron rod passing through the main hollow vane shaft, in connection with a bevel gear and pinion attached to their respective rollers, to which rollers are fastened reefing lines connected with the sails in combination, as set forth.

SEWING MACHINES.—S. Turner, of Westborough, Mass. : (Assignor to Elmer Townsend, of Boston, Mass.) I claim constructing the feeding wheel in the form of a toothed annular or ring gear, or the equivalent thereof, and connecting it with the feeding shaft by a universal joint or ring, and two sets of journals applied together and made to operate as specified, whereby the cloth or material to be sewed can be readily turned in any direction, without the necessity of lifting the presser or presser wheel, as would be required in the performance of such an operation on various sewing machines.

GLASS LANTERNS.—A. Morley, (Assignor to James Bright,) of Brooklyn, N. Y. : I claim a lamp and lantern of any described configuration, when made of glass and in one piece, as described.

LARD LAMPS.—H. Chamberlain, of Boston, Mass. : (Assignor to Wm. R. Mellurul, of New Haven, Conn.) I claim the above described improved lamp for burning lard or concrete fatty matters, made with an arrangement of the wick tubes, the lard reservoir, and the supporting bifurcated stand, as described, and with the reservoir applied to the stand so as to turn on centers and be fastened in position under any inclination or elevation of the wick tubes, as specified.

DRESSING SHIP TIMBER.—J. K. Crowell, (Assignor to Himself, Edmund Smith, and Chas. T. Stickney,) of Salem, Mass. : Now as a principal feature of my machine in which I claim there is my particular novelty, is the mode of supporting and guiding the movable carriage on which carries the timber that is to be dressed, such consisting in employing four movable rails, arranged and applied together and made adjustable, so as to make the carriage during its longitudinal movements not only have a transverse dipping movement but also a longitudinal dipping movement, or such movements as will enable it to present to the cutter wheels in a proper manner the waved surface to be dressed.

I am aware that in machines for turning irregular forms a pattern rail may have been used, or that a carriage may have been supported so as to have vertical movements on stationary guides or pattern rails, but that straight rails arranged and made adjustable with respect to one another, and applied to a carriage so as to regulate its movements, as described, have been used, is not known to me.

I therefore claim this improvement as my invention in the machine set forth, for reducing or molding timber.

MULTIFORM MOLDING PLANE.—Thos. Worrall, (Assignor to Mifflin Paul,) of Mount Holly, N. J. : I claim the slide attached to a plane by means plates and screws, which will make that plane capable of working all kinds of grooves, fillester, and moldings.

DESIGNS.

FRONTS OF CLOCK CASES.—Nicholas Muller, of New York City.

COOKING STOVES.—Amos Paul, of Newmarket, N. H.

NOTE.—Just one third of all the patents in the above list were applied for through the "Scientific American" Patent Agency.

Our business in this line is rapidly increasing, and our facilities or preparing cases without delay cannot be equalled. As an evidence of this fact we will state that sixty cases were prepared during the month of August, a larger number we will venture to say, than were ever before presented to the Patent Office through one agency, within the same length of time. We are at all times ready to advise with inventors, and will undertake to give opinions upon questions of novelty free of charge. Circulars of information are also furnished gratuitously upon application.

Money received on account of Patent Office business for the week ending Saturday, Sept. 2 :—

H. W. P., of N. Y., $130 ; J. S. R., of Ct., $25 ; J. S., of Mass., $30 ; E. H. S., of N. Y., $15 ; J. S. A. of N. Y., $30 ; E. Y., of Pa., $30 ; W. W., of N. Y., $35 ; S. P., of Ind., $30 ; J. Y., of Pa., $25 ; W. H. A., of N. Y., $15 ; H. & K. of N. Y., $15 ; A. D., of L. I., $400 ; J. S., of Ga., $10 ; I. F. M., of Ct., $45 ; H. B., of Ind., $55 ; H. & A., of N., $10 ; L. H., of N. Y., $25 ; J. G. S., of Mo., $55 ; D. B. N., of O., $25 ; S. B., of N. Y., $35 ; T. & A., of N. H., $50 ; J. B., of N. Y., $25 ; W. M. W., of N. Y., $27 ; A. R., of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Sept. 2 :—

J. Y., of Pa ; A. S., of O. ; J. S. R., of Ct. ; J. B., of N. Y. ; H. & K., of N. Y. ; J. J. L., of N. Y. ; J. S., of Ga. ; F. D., of Va. ; A. L. P., of Ct. ; D. B. N., of O. ; A. R., of L. I. ; A. D., of L. I.

Hammer for Dressing Millstones.

An improved hammer has recently been patented in France, to protect millstone dressers from the injurious effect of the silicous dust which gets into the mouth and lungs, causing so much disease. To the ordinary hammer is attached a small reservoir of brass or tin-plate, it has a hole through it exactly like that in the iron one, into which the handle is made to fit. An orifice is made in one side of it for the introduction of water, which is closed by a screw-tap—at one end there is a fine capillary hole through which water can be forced by the shock of the blow with the hammer, but through it air cannot pass, the effect of the water is to form a paste of the silicous dust which prevents it from flying about. It is said to work with admirable success.

Lubricating Oil.

A foreign exchange recommends oil obtained by the distillation of common rosin, with from five to ten per cent. of quick lime, as a good material for greasing machinery. As it is generally slightly acid, even when distilled with lime, it is recommended to add from two to five per cent. of lime or magnesia to the cold oil, which unites with the free acid, and gives the whole mass the consistence of butter.

Fires, Fires.

No country in the world is so much afflicted by extensive conflagrations as ours. We cannot tell at present, but judging from the destructive fires with which New York has been visited last year, and the accounts we have received of fires in other places, we presume that no less than $20,000,000 of property has been thus consumed. This is all a dead loss to the country, and tends greatly to retard its prosperity. The real amount of suffering arising from fires is beyond calculation. Many of them are caused by a wilful application of the incendiary's torch ; and more by carelessness than accident. In France and England, not one house is destroyed by fire for a hundred in the United States. Indeed, we are assured that in the city of Paris not more than one building is burned in three years, while in New York it is rather a wonderful thing if one is not burned down every day. The character of the buildings in the two cities accounts for this in a measure, most of the houses in Paris having thick stone walls, with very little wood in their composition. Many of the fine new buildings which have been erected in New York City, within the past five years, have excellent stone walls, but as a general thing, while the outside of our buildings look solid and well, too much timber is employed inside. During the very severe drougths which have so generally prevailed this summer, it caused us no small amount of grief to hear of so many severe fires in different places. Last winter tens of thousands of bushels of corn and wheat, and thousands of barrels of flour were consumed by fire in ships, and store houses in this and other cities. Owing to the general failure of crops this year, every bushel of grain that will be consumed by fire through carelessness, should be considered an act of sacrilege. In directing attention to this subject at present, it is for the purpose of beseeching our people to be less reckless of fires, for we believe, that although so much timber is used in buildings in our country, that with more care and watchfulness, we should not have one fire for ten that we now have. Houses inhabited by owners are not so subject to being burned as those inhabited by tenants. This shows that those who have a personal interest in the dwellings they inhabit, are far more careful of fires than those who do not have such an interest. Trust not in fire engines and annihilators to put out fires, but bend every effort to prevent them.

Save Coal.

The price of coal being so high this fall, it becomes all those who use it, to do so with the utmost economy. We believe that at least one-fourth of the fuel used by almost every family might be saved. In order to show how coals ought to be burned scientifically, so as to save fuel, we will present an essay of Prof. Arnot on the subject, with an illustration, in the first number of our next volume.

A Locomotive Feat.

A locomotive on the Columbus and Erie railroad, in Ohio, lately performed the feat of running two hundred and sixty-five miles with but a single tender of wood. This fact shows to what an extent the saving in the mere article of fuel, in the hands of prudent and skilful engineers, combined with the use of good engines, can be made to lessen the expence of running railroads.

[We have seen the above in quite a number of our exchanges, but we place no confidence in its correctness.

Back Numbers and Volumes.

We have the following numbers and volumes of the "Scientific American," which we can supply at the annexed prices :—Of Volume 5, forty numbers ; price in sheets, $1 ; bound, $1,75. Of Volume 6, all ; price in sheets, $2 ; bound, $2,75. Of Volume 7, all ; price in sheets, $2 ; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Vol. 9, complete in sheets, $2 ; bound, $2,75.

Subscribers who have missed numbers on the Volume just closing, can be supplied with copies to fill the vacancy, excepting the following numbers : 1, 6, 9, 11, 22, and 23.

INDEX.

A

Alloy, New Metallic 10
Alloys and Metals 18
Alcohol or Benzoic Acid, 238
Amalgamator, Gold, Gardiner's 348
Amalgamator, Gold, Collyer's 252
American Scientific Association 245, 278, 286, 294
Anchor, R.R., Strait's [1 fig.] 106

B

Balance, Compensating, Horton's, 329
Barrel Machinery, Heacock's, 60
Barrel Machinery, Robinson's, 196
Barrel Heads, Cutting, Crozier's, 276
Barrels, Beveling and Crozing, Crozier's 276
Bank Note Paper [4 figs.] 221
Bedsteads, Johnson's, 20
Bedsteads, Botter's, 28
Bedsteads, Collier's, 60
Bedsteads, Bigelow's, 68
Bedsteads, Merrill & Tupper's, [2 figs. 156
Bedsteads, Murphey's, 372
Bedstead Rails, Tenoning 132
Bed Pin Machine, McBride's, [2 figs.] 28, 388
Bed Bottoms, Wright's, 356
Bee Hive, Fouse's, 132
Belts, Jointing, 147, 217
Bender, [1 fig.] 280
Beverage Preparation 208
Bells, Ringing by Steam, Snow's, 260
Birds, Stuffing and Preserving 410, 290
Bit, Expanding, Gage's, 372
Bleaching Process 275
Blind Rods, Wiring 92
Blind Slats, Tenoning, Stagg's, 116
Blinds, Painting, Field's, [2 figs.] 293
Boilers, Irving's, [3 figs.] 1, 29
Boilers, to Prevent Incrustations in [2 figs.] 27, 153, 290, 344
Boilers, Williams' [2 figs.] 228, 108
Boilers, Steam 139, 193
Boilers, Regulating the Water Level in 148
Boilers, Sweeney's 308
Boilers, Marine 318
Boiler Explosions 11
Boiler Alarm, Dunn's 46
Boiler Furnace, Baker's 381
Boiler Flues, Cleaning, Beinweber's 388
Boots and Shoes 139
Boots and Shoes, Trimming the Welts of, Clark's [2 figs.] 397
Boring and Mortising Machine, Guild's, [1 fig.] 126
Boring Machine 299
Bone Dust 339, 387
Bottles, Screw Stoppered, Scott's 163
Bottles, Filling 230, 336
Brace, Carpenter's Daboll's [4 figs.] 321
Brake, Car, Morse's [2 figs.] 40
Brake, Car, Allen's 57
Brake, Car, Pernot's 180
Brake, Car, Reynolds' 84
Brake, Car, Blair's, 156
Brake, Car, Miller's 340
Bread, New Process in Making, 277, 203
Brick, Burning, [2 figs.] 24
Brick Machine 62
Brick, Substitute for 137
Brick, Half, 186
Brick Kiln, Speights' 212
Brick Machine, McMurtry's 276
Brick and Stone, Substitute for, Allen's 244
Brick Kiln, Gordon's 396
Brick Moulding, Johnson's [2 figs.] 410
Bridges, Trial of 102, 109
Bridges, Iron 325
Bridge, R.R. 262
Bridge, Champion's [4 figs.] 134, 326
Bridge, Cumberson's 172
Bridge, Thayer's [2 figs.] 352
Brine, Evaporating, Thorndike's 268
Bronze for Sheathing Ships 308
Bronze and Bronze Colors 262, 272
Brush, Fountain, Wentworth's 324
Brushes, Morrow's [2 figs.] 64
Buckle, Harness, Oyster's 356
Buckle, Manville's 44
Buffer and Draw Head, Hopkins' 92
Buildings, Fire Proof 130
Burns, Cure for 324
Butter, Preserving 48
Butter Worker, Gore's 410

C

Cable, Marine Telegraph 162
Calico 158
Calico, Colors of 37
Calico Printing [5 figs.] 198, 206
Can, Safety, Nichols' [1 fig.] 83
Canal Lock, Cast Iron 124
Candles made from Minerals and Turf [141
Candles, Manufacture of 146
Candle Mold, Laudenbacker's 180
Candlesticks, Rose's 220
Cancers Cured 155
Cannon, Breech Loading 162
Cannon, Breech Loading, Harbaugh's 188
Cannon, Breech Loading, Starr's 206
Car Truck, Eames' [1 fig.] 17
Car Truck, Brooks' 244
Car Truck, Johnson's 196
Car Truck, Hopkins' 156, 44
Car Coupling, Stout's 164
Car Coupling, Chatham's [1 fig.] 126
Car Register, Ramsey's 92
Car Seat, Bloomfield's 116
Car Seat, Mocstue's 244
Cars, Ventilating, Newton's [2 figs.] 396
Cars for Transporting Cattle 128
Cars, Baggage, Clark's 316
Carriages, Rowley's [2 figs.] 395
Carriage Coupling, Livingston's 284
Carriage Tops, Scripture's 4
Carriage Tops, Buchanan' 492
Carriage Springs, Reed's 101
Card Grinder, Freeman's 108
Cards for Jacquard Looms 174
Castors, Barker's 212
Castings, Cleaning 267
Cement, Gutta Percha 94
Cement for Bricks and Stones 148
Cement for Belting 169, 136
Cement for Steam Boilers 170
Center Piece [1 fig.] 30
Chairs, R.R. Ogden's [2 figs.] 292
Chairs for Children, Steven's 268
Chain Link Machine, Dickinson's 356
Chair, Rocking, Russel's 410
Chillblains, Remedy for 189, 211
Chimney Ventilating, Leed's [2 figs] 380
Chloroform, Application of 157
Chloroform Counteracted 276
Cholera, Treatment and Cure for 73, 368, 381
Churn, Davis' [2 figs.] 265, 121
Churn, Markham's 316
Churn, Hewett's, [1 fig.] 254
Churn, Peck's 220
Cider Mill and Vegetable Cutter, Hunt's [2 figs.] 105
Cinder Basket, Walker's [1 fig.] 183
Cistern for Rainwater 252
Clamp for Joiners, Green's [1 fig.] 76
Clamp for Joiners, Trogden's 148
Clocks, Geographical, 275
Clocks, Chinese, Botsford's 395
Clock, Telegraph, Hall's [5 figs.] 233, 236
Clocks, Electric 126 132
Clock, Engineers Railway Clock, 152
Clock Regulator in Boston 132
Clod Crusher 86
Clinch Ring Machine, Patten's 196
Cloth Napping 220
Cloth Napping, Weight's [2 fig.] 392
Cloth Cutting Machine, Harraday's [1 fig.] 353
Clothes Pin, Haskins' [1 fig.] 269
Clothes Horse, Phillips' 220
Cocoa Nuts, Tallow and Lard 269
Coffee Roasting 135
Coke Ovens, Lambert's 276
Colors, Painters' 209
Comet, The 245
Condenser, Tubular 385
Condenser, Woolen, Hoagland's [1 fig.] 248
Condenser for Wool Carding Machines, Howard's 404
Copping Sash Stuff, Fingers 108
Corn Planter. Pease's [1 fig.] 72
Corn Planter, Wakefield's 196
Corn Planter, Malone's [2 figs.] 238
Corn Planter, Holt's 300
Corn Sheller 86
Corn Harvester, Bruce's 140
Corn and Cob Mill, Killgore's 100
Corn Stalks, Cutting, Burnham's 260
Corn Stalks, Cutting and Grinding, Huyett's 140
Corns, Cure for 192, 285
Cotton 118, 128, 130
Cotton, Manufacture of 22, 142
Cotton Seed 144
Cotton Thread 46
Cotton, Cleaning Stained 48, 134
Cotton in Linen 162
Cotton in Woolen or Silk 174, 186
Cotton Gin, Campbell's [1 fig.] 20, 200
Cotton Gin, Brown's 236
Cotton Cleaner, Mell's 348
Cotton Press, Adams' 292
Cotton Press, Snow & Headley's [1 fig.] 313
Cotton Press, Lewis' [2 figs.) 233
Cow Catcher, McLung,s 124
Cracker Machines 186
Cream of Tartar Adulterated 58
Cream Freezers, Powel's 363
Cucumbers, Growing 256
Cultivator, Rotary, Johnson's 410
Cut-Off, Montgomery's [3 figs.] 22, 76
Cut-Off, Cope & Bracken's 324
Cut-Off, Ashcroft's [2 figs.] 276, 376

D

Daguerreotypes Attached to Monuments, Wilmot's 410
Dam, Portable, DeGuinon's [2 figs.] 289
Deafness, Cure for 49
Deafness, Instruments for Curing [1 fig.] 182, 186
Deck Iron for Ships, Corwin's 316
Deal Sawing Machine [1 fig.] 193
Dentrifice 73
Dedrology 272
Derrick, Holmes' [1 fig.] 225
Designs and Patterns on Wood 108
Diarrhea, Remedy for 368
Dies and Punches, Lormer and Seiss' 324
Ditching Machine, Lyon's 204
Diving Bell, Forman's [1 fig.] 8
Door Strip, Haviland's 148
Door Key, Damarel's 348
Doubling and Reeling Machine, Sevan's [1 fig.] 304
Drills, Iron, Lyon's [1 fig.] 100
Drills, Iron, Bushnell's, [3 figs.] 140, 153
Drills, Iron, Daniels' [2 figs.] 104
Drills, Iron, Tewkesbury's [2 figs.] 249
Drill, Rock, Frasier's 164
Drill, Rock, Dunham's 100
Drill, Rock, Wright's 108
Drone Bee Trap, Wheeler's 124, 360
Drugs, Adulteration of 158
Drying and Tentering Machine, Kennedys' 244
Dust Concentrators for Rail Cars 108
Dye for Felt Hats 222

E

Ear Ring, Higgins' 292
Eaves Troughs, Woodruff's [1 fig.] 274
Elbow for Stove Pipe 57
Electrotyping 21
Electrical Conductor 65
Electric Process for Raising Ships 86, [99
Electricity as a Motor 186
Electro Plating and Gilding 96
Embankment Railway, Hinde's 348
Emery Sand Paper 164
Engines, Steam, 14, 78, 98, 219
Engines, Steam, Trial of 118, 134
Engines, Steam, Portable, Howard & Bradford's [1 fig.] 89
Engines, Steam, Portable, Lebby's 184
Engines, Oscillating, Gardners' [2 figs.] 44
Engines, Rotary, Bristol's [3 figs.] 65
Engines, Rotary, Barrows' 160
Engines, Rotary, Salomon's [3 figs.] 308
Engines, Rotary, 219
Engines, Electric, Page's 379, 394
Engines, Electro Magnetic, Vergnes' [1 fig.] 184, 69
Engines, Hydraulic, Carey & Smith's 124
Engines, Oscillating, Stephens' [2 figs.] 73
Engines, Steam Fire 85, 90, 161, 365
Engines, Smoke and Steam 193
Engraving, Heliographic Steel, St. Victor's 123
Ericsson Caloric Ship, 157, 172, 245
Ericsson Sunk and Raised 269, 282
Ericsson turned into a Steamer 365
Excavator, Murphey's 52
Excavator, Brown's 244
Explosions, Steam Boiler 211, 266

F

Fabrics, Vulcanized 45
Fair of the American Institute 46
Fanning Mills and Separators 78
Faucett, Larwell & Cross' [3 figs.] 97
Faucet, Bouton's [1 fig.] 297
Feeding Printing Presses, Hazelton's 156
Feeding Printing Presses, Chapman's 204
Feeding Printing Presses, Clark's 148
Fellies, Bending, Cox's [3 figs.] 404
Fencing, New Mode of 249
Fire Arms, Boutgen's 57
Fire Arms, Gilby's [2 figs.] 188
Fire Arms, Day's 339
Fire Arms, Newton's 404, 300
Fire Arms, Adams' 284
Fire Arms, Charger for, Peavey's 252
Fire Arms, Primer for, Newton's 76
Fire Kindlers 146
Fire Escapes 225
Fires on Steamboats, to Extinguish 368
Fish Hooks, Sigler's [1 fig.] 340, 44
Fishing Rod, Menzel's 396
Flax Machinery 62
Flax Culture 110
Flax, Treatment of 139, 197
Flax Industry 242, 250, 258, 266, 274, 282, 290 298, 307, 314, 322, 346, 354, 370, 394
Flax Machine, Caryl's [2 figs.] 393
Flax Machine, Boyack's 212
Flax Breaker, Hinde's 324
Flax Dresser, Norfolk's [2 figs.] 361
Flanges on Wrought Iron Beams, 220
Flasks for Casting R.R. Wheels, Usher's 260
Float Protector, Akins' 236
Flock Cutting Machine, Pitts' [1 fig.] 84
Flouring Process, Bonnell's [1 fig.] 36
Flour Machinery, Taggart's [2 figs.] 116
Flour and Meal, Preserving, Pearsall's 300
Fly Trap, Flanders' [2 figs.] 389, 100
Fork, Agricultural Franklin's [1 fig.] 180
Former for Boot Leather, Chillcot & Snell, 118
Fruits and Meats, Preserving 27, 172
Furnaces, Bakers' [1 fig.] 60, 65, 112, 150
Furnaces, Tiffany's 68
Furnaces, Hayes' 140
Furnaces, Thompson's 84
Furnaces, Willis' 92
Furnaces, Gordon's 193
Furnaces 34
Furnaces, Grate Bar for, Cotton's [2 figs.] 100, 140

G

Galvanic Batteries 176
Galvanic Power for Propelling Ships 291
Garment, Machine for Cutting Out, Harraday's 120
Gas Meter, Collier's 28
Gas Burner, Mayer's 133
Gas Regulators, Mayer's 380
Gas Regulators, Dodge's 380
Gas Regulators, Hoard & Palmer's 300
Gas, Kerosene 29
Gas, Rosin Oil 60
Gas, Explosions 64
Gas, Heating Apparatus 146
Gas Light 155
Gas Stove 162
Gates for Saw Mills, Vidal's 244
Gates for Water Wheels, Turner's [1 fig.] 380
Gauge for Steam Boilers, Echol's [1 fig.] 16
Gauge for Steam Boilers, Smith's 212
Gauge, Slitting, Ballard's [1 fig.] 306, 294
Gilding 80, 88, 96, 104
Gilding Metals 251
Gilding Silk Thread 243
Gold Beating Machine 14
Gold Machine, Berdan's 129
Gold Extracted without Quicksilver, 134
Gold Separation 197
Gold, Preparing 204
Gold, Refining 330
Governor for Steam Engines, Ford's 388
Governor for Steam Engines 138, 150, 156, 186
Grape Disease, to Cure 104, 171
Grape Frame, Cross's [2 figs.] 401
Grass Drying 149, 174
Grate Bars, Vansockle's [1 fig.] 55
Grate, Fire, Winer's 84
Grates and Stoves 139
Grease Feeder, Hoyt's 284
Guano 136, 157
Guano, Sowing, Marshal's 324
Guano, Home Made 281
Guano, How to Apply 249
Guard Rails, Sanborn's 316
Gum Arabic Receipts 13, 65, 90
Gun Lock, Charpie's [1 fig.] 284
Gutta Percha, Substitute for 146
Gutta Percha, Increase in the Use of 216
Gutta Percha Tubing 235;

H

Hammer for Dressing Mill Stones 412
Hammer, Steam, Morris' 20
Hammer, Trip, Peers' [1 fig.] 76, 145
Harrow, Flexible, Ramsay's [1 fig.] 103 180
Harness, Life Preserving, Yellott's [3 figs.] 252
Hat Presser, Field & Kinsman's 68
Hats, Felting, Taylor's 228
Hay Meal 154, 219
Hay Knife, Whalen's [1 fig.] 364
Hay Press, Deering & Dederick's [1 fig.] 384
Heater, Flat Iron, Coburn's [3 figs.] 276
Heating Apparatus 90
Heating Rooms, Lyman's [4 figs.] 304
Hemp, Preparing 94
Hen's Nest, Ament's [1 fig.] 200, 116
Hinges, Washer, Gates' 296
Hopper for Screw Machines, Greaves' [1 fig.] 4
Horses, Shoeing 74
Horse Power, Bocage's [1 fig.] 156
Horse Power, McCord's [2 figs.] 316
Hose Protector, Demarest's [2 figs.] 281
Hose Coupling, McPhail & Barrett's 284

I

Ice, Artificial 362
Imponderable Agents 18, 26, 34, 42, 56, 64, 72, 106, 114, 122, 130, 138 146, 154, 162
India Rubber for Steam Packing 37
India Rubber beneath Rails 116
India Rubber, Goodyear's 212
India Rubber, Day's 213, 230
Indigo, Preparing 65
Indigo, Red Sulphate of 200
Ink 50, 74, 99
Ink and Paper 160
Iron, R.R. 38
Iron, To Coat with Copper or Brass 48
Iron, Protecting for Roofing 94
Iron, Welding with Steel 94
Iron Smelting 203
Iron, Enameling, Walton's [3 figs.] 182, 267
Iron, Houses and Cottages 220, 293
Iron Houses, Mettam's [1 fig.] 335
Iron Wheel Fellies, Bowen & Pederick's 388
Iron, Uniting Wrought and Cast 322
Iron Shutters, Reed's 292
Iron Tunnel 232
Irregular Forms Cutting, Reynold's 404

J & K

Jacquard Apparatus 242
Journal Boxes, Composition for, Garratt's 276
Journal Boxes, Hoagland's 100
Journal, Anti-friction, Smith's 52
Journals of Carriages 168
Joint for Air Heating Pipes, Young's 140
Knitting Machine 46
Knitting Machine, Wood's 220

L

Lacquer for Papier Mache 200
Lamps Monnin & Booth's 172
Lantern, Morley's 204
Lath Machine, Packard's [1 fig.] 76, 388
Lathes, Turning, Carpenter's 180
Lathes, Carrier for, Zook's 108
Leather and its Improvements 85
Leather, Artificial 146
L'd for Boxes, Williams' [1 fig.] 348
Life Preserver Seat, Thompson's 341
Life Boat, Frasse's [2 figs.] 144
Lifting Jacks, Howell's 228
Lifting Jacks, Genung's 316
Lifting Jacks, Jenkins' 318
Lifting Jacks, Dubois & Smith's 316
Light by Electricity 409
Lights, Ferry Boat 165
Light Houses 140
Lightning Conductors for Ships 94, 366
Lime Dust on Plants 237
Linen Manufacture 94, 102
Locomotive, Marine, Frost's [2 figs.] 180, 205
Locomotive, Hot Air 410
Locomotive, Parallel and Connection, Martin's 68
Locks, Crygier's 84
Locks, Freeman & Rogers' 180
Locks for Safes, Klein's 244
Logotype 64
Looms for Weaving 129
Looms, Patent Check, Eccles' [4 figs.] 162
Looms, Henley's 324
Loom Clasps, Copeland's 332
Lowering Ships' Boats [1 fig.] 232
Lubricator, Wade's [2 figs.] 7, 150, 366
Lubricating Materials 193, 283
Lubricating Boxes, Parkhurst's [3 figs.] 260

M

Madder 208
Magnets, Artificial 258
Mahogany, To Take Ink out of 316
Manure for Strawberries 298
Manure from Sea Weed 242
Manure, Making 139
Manure, Irrigating 162
Manure Gatherer, Hunt's 179
Matches, To make 80
Metal Rolling 262
Metal, Bending Sheet, Booth's 132
Metal Disks, Bending and Cutting, Savage's [1 fig.] 28
Metals, Union of, Carhart's 356
Metals, Preserving 10
Metals, Composite 18
Metals, Separating 96
Metals, Precious 171
Metals, Platinoid 171
Metallic Packing, Russel's 20
Metallurgy 75
Meter, Liquor 68
Meter, Water, Hartin's [3 figs.] 196
Measuring Distances [1 fig.] 228
Mills, Breakage of 214
Mills, Grinding, Harrison's [1 fig.] 345
Mills, Grinding, Latourette's [2 figs.] 360
Mills, Grinding Reed's [2 figs.] 372
Milling, Mann's 268
Millstones, Dressing, Shands' [1 fig.] 76
Mildew and Gooseberries 241
Miter Box, Willis' 164
Mop Head, March's 32
Mortising Machine, Purden's [1 fig.] 36
Mortising Machine, Kyle's 348
Mortising Machine, Moreland & Nixon's [1 fig.] 257
Mortising Machine, Plumb's 316
Mortising and Boring Machine 54
Mortising and Boring Machine, Guild's [1 fig.] 126
Mowing Machine, Hallenbeck's 28
Musquito Net, Haskin's 306

N

Nail Machine 284
Nut Protector, Graves' [1 fig.] 208

O

Ocean Locomotion 169
Oil, Lubricating, Pease's 348
Oil, Lubricating 150, 370
Oil, Olive 48, 262
Oil from Coal Shales 10
Oil. Adulteration of 44
Oil of Turpentine 89
Oil, Purifying Fish 157, 192
Oil, Lubricating 412
Oil of Hops 17
Oil Varnish 180
Oil Cup, Clark's 44
Oil Lamps, Buchanan's 57
Oil, Dripper, Draper & Scott's [1 fig.] 188
Oil Chamber, Rice's 116
Ores, Washing, Edward's 52
Ornamental Tables [3 figs.] 22, 46
Ornamental Plate [1 fig.] 54
Ornaments, Strengthening Cast Iron Hill's 124
Osage Orange for Hedges 254
Ovals, Turning, Merrill's [1 fig.] 129
Oxyd of Gold 169, 274
Oxyd of Copper 260

P

Paddle Wheel, Irving's [2 figs.] 20
Paddle Wheel, Glover's 52
Pad for Penmen, Goshon & Tower's [2 figs.] 48
Pans, Sugar Refining 357
Pans, Evaporating, Buckley's 196
Paper from Peat 242
Paper from Straw 251
Paper from Wood 273
Paper, Materials for 132
Paper, Manufacture of 163
Paper, Tracing 163
Paper Boxes, Scoring and Cutting, Denison's [1 fig.] 52
Parallel Motion, Thompson's 348
Paste for making Ornamental Work 146
Pavement Foundations, Wickersham's 348
Pencil Case, Clark's 4
Pencil Case, Rauch's 172
Pencil, Writing 148
Pencil Writing, Purifying Black Lead for 206
Pens, Steel 203
Pegging Machine, Gallahue's [1 fig.] 25
Pegging Machine, Standish's [1 fig.] 337
Photography on Stone 10. 242
Photography, Lithographic 216
Photograph on Steel Plate 216
Pianofortes, Wild's 132
Pianofortes, Corliss' [2 figs.] 132, 100
Picking Machine, Kitson's 20
Pins, Solid Headed 381
Pin Factory 352
Piston 86
Pitchers, French Bronze [3 figs.] 38
Planing Machine, Osgood's [1 fig.] 52.
Planing Machine 52 [132
Planing Saw, Andrews' [1 fig.] 192
Plane, Bevelling, Wheeler & Co.'s 292
Plaster, Modelling in 58
Plastic Compound 275, 392
Plating Apparatus 362
Plow and Digging Machine 78
Plow Cultivator, Whitman's [1 fig.] 92
Plow, Hill Side, Baker's 316
Plow, Hill Side, Harrison & Metcalf's [2 figs.] 336
Plow, Prairie, Bruce's 132
Pneumatic Springs, Ware's [2 figs.] 164
Potato, Disease and Preservation of 72, 90
Potato Planter, Anderson's 108
Potato Planter, Hutchinson's [1 fig.] 108
Potato Digger, McGaffey's 228
Potash, Pure Caustic 160
Power Looms, Harness Motion for, Greehalgh's [1 fig.] 128
Press, Rotary 78
Press, Hand, Foster's [1 fig.] 121
Press, Self-Acting, Holt's 44
Press, Lever, Davis' 93
Press. Printing, Street's 164
Press, Printing, Tripp's 372
Printing Press, Starratt's 348
Printing 400
Printing and Type Machinery 86
Printing Colors on Textile Fabrics 130
Propeller, Wave [2 figs.] 384
Projectile, Capt. Norton's [1 fig.] 145
Pump, Centrifugal, Andrews' 364
Pump, Rotary, Manny's 84
Pump, R.R., Strait's 172
Pumps, Trial of 260
Pumps, Rotary 6
Punching and Shearing Machine, Davie and Stephen's [1 fig.] 217

Q

Quartz Crusher, Collyer's [1 fig.] 178
Quartz Crusher, Experiments 165
Quartz Crusher, Gardiner's 316, 356
Quartz Crusher, Russing's [1 fig.] 377

R

Railroad for Broadway [Swett's] 1 fig. 38
Railroad for Broadway, Deitz's [1 fig.] 81
Railroad for Broadway 82, 97
Railroad for Broadway, Atmospheric 112
Railroad for Broadway, Wickersham's [2 figs.] 152
Railroad Bars, Rolling 362
Railroad Trains, Economy in Working 225
Rail, Rack 76
Rails, Cast and Wrought Iron 163
Raking Apparatus, Robert's 84
Rake, Horse, Dingman's 124
Ram Hydraulic, West 324
Ram, Water 141
Rat Trap, Harper's 410.
Rape Cake 197
Reaping Machines, Smith's 84
Reaping Machines, Sickles' 132
Reaping Machines 218, 190
Reaping and Mowing, Week's 236
Reaping and Mowing Machines [2 fig.] 70, 107
Reaping and Mowing Machines, Atkins' [1 fig.] 41
Reapers, Trial of 186
Red Fire, Cheap 94
Regulator for Steam Boiler Fires, Clark's [1 fig.] 281
Report of the Commissioner of Patents for 1853 226, 234, 237
Report of the Crystal Palace Juries 168
Respirator 280
Reservoir for Compressed Air, Sickles' 316
Re-Vaccination 228
Roller Box, Parry's [1 fig.] 317
Root Cleaner, Fairchild & Richardson's 12
Rose Bugs to Destroy 398
Russian Sheet Iron Imitation of 38

S

Sash Window, Nutting [1 fig.] 28
Sash Fastening, Smith's 148
Sash Fastening, Connelly's (2 figs.] 312
Sash Fastening, Hadaway's [2 fig.] 408
Sash Stiles, Mortising, Smith 284
Saws, Hanging, Taylor's 52
Saws and Saw Mills 54, 251
Saws, Straining, Rapp & Wright's [1 fig.] 297
Saws, Straining, Fishwick's 108
Saws, Feed Motion of, Lovecraft's 276
Saws, Tempering, Clemson's 410
Saws, Circular, [1 fig.] 241
Saws, Circular, Slater 380
Saws, Cotton Gin, Watson's 212
Saw Dresser, Kimmell's 68
Saw Tooth Corrector, Parson's [2 figs.] 80
Saw Doctor, Strait's [2 figs.] 113
Saw Mills, Waterman's 76
Sawing Machine, Emmson's [2 figs.] 196, 201
Sawing Machine, Packard's 202
Sawing Machine, Squire's 316
Sawing Machine, Winter's [1 fig.] 396
Sawing Machine, Wick's 381
Sawing Machine, Alexander's [1 fig.] 364
Saws and Planing 329
Sawing Ship Stuff, Hamilton's [3 figs.] 177
Sawing Spoke Stuff, Blanchard's 172
Screw Presses, McMillan's 44
Screw Cutter, Robertson's 124
Screw Cutter, Plant's 188
Screws for Planking Ships, Staples' [1 fig.] 203
Screw Propeller, Perry's 228
Scythe Snath Fastening, Boley's [4 figs.] 316, 324
Seed Planter Case's 100
Seed Planter, Phillips' [1 fig.] 164
Seed Planter, McGaffey's 228
Seed Planter, McFarland's [1 fig.] 260
Seed Planter, Witherow's [2 figs.] 313
Separator, Gold 364
Separator, Grain, Moffitt's [2 figs.] 185
Sewing Machine, Miller's [2 figs.] 9
Sewing Machine, Parham's 396
Sheathing for Ships 267
Sheep, Coating, Dimick's 92
Ships, Instrument for Measuring the Speed of, DeGraw's 410
Shoe Pegging by Machinery 6
Shoe Welts, Cutting, Trofatter's 316
Shutter Guard, Miggott's 180
Shutter Fastener 62
Shower Bath, Baldwin's 108
Sick Headache, Cure for 227
Signals R.R. 4, 200
Signals R. R., Gardiner's 252
Signal, R. R., Morton's 254
Skiving Boot Counters, Trofatter's [2 figs.] 137
Sleepers, R.R. 10
Slotting Machine, William's [1 fig.] 186, 321
Smelting by Electricity [1 fig.] 264
Smut Machine, Bodwell's 260
Snake Bites, Cure for 360, 368
Soap 96, 203
Soap molds for Die Sinking 190
Soap and Paint 10
Soapstone, Use of 355
Soda Water, Cooling 318
Soldering Cast Steel 260
Soldering Salt 267
Soldering Wrought and Cast Iron 267
Soundings, Deep Sea [1 fig.] 42, 256
Spark Arrester, Mahony's 12
Spark Arrester, Arnold's 92
Spark Arresters, Cuttings [1 fig.] 112
Spark Arresters, Rollin's [3 figs.] 292, 340
Spark Arresters, Abos' 324
Spark Arresters, Simons & Breare's 360
Spoke Machine, Carlin's 36
Spoke Machine, Landphere & Remmington 140
Spoke Machine, Tibbett's 372
Sprains in Horses, Cure for 57
Stammering Apparatus, Bates' [2 figs.] 370
Stams and Steam 381
Starch, Manufacture of 107, 164
Starch Machine, [1 fig.] 409
Starch, Drying 148
Stave Machine, Hawkins' [3 figs.] 49
Stave Machine, Drawbaugh's 228
Stave Machine, Elliott's [4 figs.] 209
Stave Machine, Warner's [2 figs.] 273
Stave and Barrel Machinery 54
Steam Boiler Alarm 46
Steam Repulsion 166
Steam, Exhausting, Wilson's [3 figs.] 216
Steel, Hardening and Cutting 208
Steel, Tempering and Grinding 385
Stereoscopes, Mascher's [1 fig.] 17
Stone Dressing Machine [Eastman's [1 fig.] 60
Stone Dressing Machine, Rotary, Eastman's [1 fig.] 68
Stone Dressing Machine, Porter's 364
Stone Drilling Mach., Wright's [2 figs.] 332
Stone Sawing Machine, Greeley's 132
Stones, Locking, Avery [3 figs.] 348
Stone and Cement 98
Stone, Artificial 74
Stoves, Portable, Arnold's [2 figs.] 68, 368
Stoves, Cooking 100
Stoves, Smoke Consuming, Hills 324
Straw Cutter, Sanford's 276
Straw and Vegetable Cutter, Gale's [1 fig.] 136
Street Sweeping Machine 6
Street Pavement, Darling's 172
Street Indicator 172
Street Sprinkler, Worthington's 196
Sugar Molds 212
Sugar Cane, Extracting the Juice from 139
Sugar Refining 174
Surveyors' Instruments, Averill's 68
Switches R. R., Hancock's 204
Switches R.R., Simmons' 212
Switches, R.R., Klein's [2 figs.] 268
Switches, R.R., Demarest's 388

T

T Square, Taggart's [1 fig.] 120
Tables, Pusey's [2 figs.] 92
Tables, Sayres' [1 fig.] 168
Tables, Mahan's 340
Tables, Brown's 340
Table Leaves, Supporting [1 fig.] 232
Tallow 253
Tallow, Hardening 386
Tallow, Purifying 122
Tanning Process, Eaton's 3
Tanning Process 94, 139, 192
Tanning Cotton and Linen 103
Tape Worm Trap 380
Tea, the Chemistry of 293
Tea and Coffee 197
Tea Kettle, Page's 76
Teeth, Anatomy of 244, 155, 165, 256
Telegraph, Universal 136
Telegraph, Secret 132
Telegraph, Submarine 290, 52
Telegraph, Underground 214
Telegraph, Fire Alarm 213
Telegraphic Batteries 11
Temple for Looms, Turrell's 188
Tenon Machine, Wardwell's 340
Threshing Machines, Garlington's [2 figs.] 300, 60
Threshing Machines 78
Threshing Machines, Moore's 228
Throttle Valve, Keating's 76
Tin, Obtaining 66
Tin in California 161
Tin Foil 219
Tinning 267
Tinning Iron Plates 148
Tickets, Printing Railway, Edmonson's 372
Tobacco 285
Tobacco Pressing Machine, Parker's [1 fig.] 4
Toggle Press, McComb's [1 fig.] 140
Tools, Shoemakers', Vittally & Kolb's 156
Track, R.R. Ingersoll's 156
Treenails 20
Treenails, Wood Screw 174
Tube, Roving, Dean's 340
Tube, Roving, Sargent's 404
Turn Table, Robie's 156
Type Forms, Locking in Chases, Sprague's 164
Typographer, Mechanical 148

V

Valve Motion, Collins', [1 Fig.] 113
Valve Motion, Goodrum, 124
Valve Cock, Griffith, [3 Fig.] 244
Valves, Cornish 129
Valves, Safety 263
Valves, Slide Davis, 260
Valves, Slide Darling, [1 Fig.] 401, 316
Valves, steam Devlibiss, 364
Valves for Locomotives Gray, 214
Varnishes 296
Varnish, Copal 318
Varnish, Dennara 334

Varnish for Iron Work 169
Vegetable Substances, preserving 122
Venetian Red 78
Veneers, polishing
Ventilators Leeds [1 fig.] 160
Ventilators Cooley, 220
Ventilating Cars Bereau, 268
Ventilating Cars Ruttan, 221
Ventilating Cars Waterbury, 405]
Ventilating Parlor Stoves, Whyte & Parker, 228

W

Wagons, Tail Boards of Harris 276
Wash for Porous and other Walls 123
Washing Machine, India Rubber 181
Watch Escapement, Devlin's, 100
Watch, Solar 198
Water Closet, Edgar's 188
Water Closet, Bartholomew's [1 fig.] 340
Water Pipe, Indestructible [2 figs.] 237
Water Wheels [5 figs.] 214, 223, 230, 238, 246, 262
Water Wheels, Robert's [1 fig.] 276
Water Wheels, True's [3 figs.] 320
Water Wheels, Warren's 372
Water Wheel Gate 352
Weaving Ginghams 193
Weighing and Packing Machine, Harris, [3 figs.] 6, 57
Welding Powder 207
Wells, Artesian 64, 136, 144
Wheat Cleaning Machine, Taggart [3 figs.] 284
Wheels, R.R. Car, Solliday, [3 figs.] 212
Wheels, R.R. Car, Walker's, 200
Wheels, R.R. Car, Glass, [1 fig.] 305
Wheels, R.R. Car, Mott, [3 figs.] 265
Wheelbarrow 65
Whiffletrees, Pardee's, 300
Whitewash Receipt 128
White Lead 156
Windmill, Sickles's 244
Windmill, Halladay's 364
Winnower, Grain, Canby's [2 figs.] 12
Wire, American 38
Wood Moldings, Planing 316
Wool Picker, Kellogg's [1 Fig.]
Wrench, Smith's 204

Y & Z

Yoke, Horse Neck, Pierce's [2 figs.] 356
Zinc Applied to Ship Building 187
Zinc Spinning 196
Zinc Paint Mill [3 figs.] 229

PATENT CLAIMS.

A

Accordeons 323
Alcohol, Separating water from 131
Amalgamators, Gold 243, 315, 390, 398
Amputating Apparatus 155
Annunciators 35, 83
Anvils, Polishing 35
Apple Parer 35, 259
Arch Boards 358
Archil 342
Ash Pans 43
Augers, Gimlets, &c. 338
Augers, Dies for 413
Axes 374
Axles and Shafts 163
Axles, Carriage 333, 342
Axles, R.R. 171
Axles, Rolling Shoulders on 406

B

Balloons 358
Barrel Heads 83, 179
Barrels, Making 227
Bathing Tubs 27
Battery, Sub-marine 350
Bed Bottoms 11, 323 (2cl.), 390
Bed Pins 303, 275
Bedsteads 35, 115, 131, 147, 267 (2cl.), 374, 383, 412
Bedstead Rails 91 (3cl.)
Bedstead Fastenings 115, 139, 243, 358
Bells, Air 51
Bee Hives 59, 67, 163, 263
Bells, Ringing fixed 107
Bells, Ringing by steam 358
Bells, Hanging 343
Bells, Horse 187, 195
Bench Hooks, Socket for 203
Berth Knee Former 315
Beveling Plane 330
Bevel Surfaces, Sawing 139
Binding Folder 412
Bit Stocks 67, 115, 179
Bit Fastening 243
Bit, Expansion 275
Bits for Carving Machines 283
Blasting Powder 91
Blankets, Attaching to Cylinders of Printing Presses 291
Bleaching Apparatus 283
Blinds, Cleaning 259
Blinds, Painting 259
Blinds, Folding 259
Blinds, Making 163
Blinds, Iron Slats for 358
Blinds, Mortising Frames of 147
Blind Slats, Tenoning 235
Blow Pipes 19 (3cl.)
Blocks, Printing 171
Boards, Sawing thin 399
Boards, Grooving 235 390
Bodies, Metallic 197
Bodies, Car 51
Body Braces 91
Boilers, Steam 131, 323, 331 (3cl.), 350, 366, 374, 398
Boilers, Feed Water Apparatus for 155, 235, 290, 331, 383
Boilers, Flue Bottom of 283
Boilers, Plugs for 311
Boilers, to prevent Incrustations in 299
Boilers, Preventing Explosions in 406
Boilers, Water Indicator for 291, 315
Boilers, Damper for 139
Boilers, Fusible Disks in 203
Bolts and Locks 323
Bonnet Frames 343
Bookbinders' Boards 43, 139
Book Cover making 299
Books, Turning the Leaves of 139
Books, Paging 171, 187, 291
Boots and Shoes, India Rubber Soles for 11, 155
Boots and Shoes, Cutting 11, 51, 283, 341, 390 (2cl.)
Boots and Shoes, Screw Fastening for 11
Boots and Shoes, Trimming 83, 393
Boots and Shoes, Pegging 147, 155, 187, 291, 330, 358, 366, 398 (2cl.)
Boot Counters, Skiving 99, 267
Boot Jacks 11
Boring and Mortising Machine 251
Bottles 374 (2cl.)
Bottles, Closing Air-tight 398
Bottles, Gauge for 59
Bottles, Washing 315
Bottles, Stoppering 3, 374, 358
Box Machine 299
Boxes, Fitting Heads to 374
Boxes, Anti-friction 227
Bracelet and Clasp 299
Brads, Cutting 343
Braiding Machine 235, 390
Brakes, Car 3, 131, 163, 235 (2cl.), 251, 398 (2cl.)
Brakes, Carriage 75, 211, 358
Brakes, Operating 115
Breast Cups 412
Breast Pump 331
Brick Machines 3, 115, 211, 251, 259, 267, 383 (2cl.), 390 (2cl.)
Bricking Molding 331
Brick Kilns 315, 350 (2cl.)
Bridges 91, 187, 267, 283, 358, 390
Bridle Bits 393
Bristles Cleaning, &c. 179
Brooms 382
Broom Handles 19
Brushes Painters 331
Brushes, Frames and Handles of 275
Buckles 323, 366
Buggies 315, 390
Bureau, Portable 406
Bullet Molds 267
Burglar Alarms 35, 331
Buttons Wooden 343
Buttons, Ornamenting 358
Button Hole Cutter 299
Butter Worker 374 (2cl.)
Butter Weighing and Printing 283

C

Calico Printing Cylinders 235
Callipers 243, 382
Cameras 307
Camphor Mixture 358
Candle Mold Machine 131, 342
Candlesticks 374
Cans, Sealing 3, 147, 358
Cans, Fluid 19
Capstan and Windlass 331, 342
Cap for Masts 382
Cars, Replacing on the Track 107, 323
Cars, R.R. 243
Cars, Earth 251
Cars, Dumping 163, 259, 383 (2cl.), 390
Cars, Excluding Dust from 147, 219
Cars, Unloading 398
Carriages 131, 323, 390 (2cl.)
Carriage Tops 139, 243, 331 (2cl.)
Carding 203, 382
Card Teeth 323, 382
Carpet Bags 171
Carpets, Two-ply 403
Carpet Stretchers 51
Carpenters' Squares, Graduating 51, 299
Carving Marble and Stone 358
Cartridges 390
Case for holding Tickets 291
Casks, Turning 331
Casters, Tool for Boring Recesses for 406
Casters, Furniture 171, 382
Catamenial Supporter 406
Cement Compound 350, 358
Chains, Making 27
Chain Hook 358
Chain Cables, Stoppering 374
Chain Hook 299
Chairs, Childrens' 412
Chairs, R.R. 51, 303, 243
Chairs, Step 59
Chairs, Dental 179
Chairs, Cane 358
Chairs, Head Rest for 235
Cheese Presses 350
Chuck for holding Cylindrical Bodies 307
Churns 83, 171, 203, 235
Clamp for laying Floors 27
Clamp for holding Steel Plates 27
Clamp for Clothes Lines 59, 115, 219
Clapboards, Sawing and Planing 131
Clapboard Joint 291
Clapboards, Sawing 406
Clasps 155, 235
Clinch Rings 275
Clocks 107, 374
Clock Case Front 291, 299 (2cl.)
Clock Case 412
Cloth, Drying 187, 195, 342
Cloth Weaving Double 331
Cloth Tentering 331
Cloth, Folding and Measuring 331, 259, 382
Cloth Cutting 51, 307
Cloth Bucking 11
Cloth Napping 323
Cloth Fulling 163
Clothes Pins 195
Clover Hullers 43, 227, 390
Coal Sifter 358
Cock, Stop and Waste 406
Coffee, Hulling and Scouring 131
Coffins 43, 343 (2cl.)
Cog Gearing 406
Coin Detector 3
Colors to Stone 195
Collodion for Photo. Pictures 350
Combing Fibrous Materials 99
Condensers 67, 99, 107, 358
Constructing Ships for safety 299
Cooking Apparatus 374
Copying Press 163
Cordage 147, 195, 342
Corn Sheller 3 (2cl.), 139, 147
Corn Planter 35, 147
Corn Crusher 307
Corn Husking Machine 135
Corn Husks, Hackling 358
Cotton Gins 3, 147 (3cl.), 259, 374, 366
Cotton Stalk Cutter 19
Cotton Presses 131, 171
Cotton Picker Cylinders 203
Cotton, Combing 343
Cotton Cleaning 251, 259
Cotton Cards, Grinding 219
Cotton Spinning 275
Cotton Topping 35
Counting Machine 406
Couplings, Car 67, 259, 323, 374, 383, 39
Cow Catcher 398
Crackers, Molding 383
Cradles Grain 67
Croaling Machine 227, 243
Cultivators 67, 83, 147, 171, 219, 235, 251 (3cl.), 315, 343, 374 (2cl.), 342 (2cl.) 412
Curry Combs 59
Cutters, Grass and Grain 203
Cutters, Cane and Maize 67
Cutters, Cob and Stalk 43, 374
Cutters, Vegetable 43
Cylinders, Wood 67

D

Daguerreotype Cases 299
Daguerreotype Plate Holder 35, 83, 171, 179, 406
Daguerreotype Plate Buffer 171
Daguerreotype Plate Coating Box for 83
Dampers and Furnaces, Operating 406
Derrick 195
Dies for making Rings from Metal 374
Discharging Coal from Canal Boats 375, 283
Distilling Apparatus 163, 267, 275
Doors, Fastening for 147
Door Knobs 406
Dovetailing Tool for 195
Drags or Anchors, Floating 406
Draining Machine 27
Dredging Machine 227
Drills, Metal 19, 343
Drop and Die Machine 243
Dry Docks 311
Dyeing Process 227, 307
Dyeing Apparatus 227

E

Ear Rings, Fastenings for 291
Eaves Troughs, Suspending 211
Ellipses, Cutting 147
Engines Rotary 35, 179, 219, 406
Engines, Hydraulic 19, 237
Engines, Air 35, 203, 275
Engines, Hydro-dynamic 275
Engines, Steam 231 (3 cl.), 350, 406
Engines, Parallel Motion of 358,
Engines, Fire 382
Engines, Actuating 27
Engines, Actuating by Bi-sulphuret of Carbon 406
Engines, Electro Magnetic 171
Engines, Regulating Speed of 67, 350
Engines, Fire Boxes of 43
Engines and Propellers 51
Engines, Packing of Pistons for 275
Engines, Valves of 275
Engines, Pistons for 283
Engraving on Glass 342
Excavators 59, 299, 315, 350, 366
Eye Bath Syringe 267
Eylet Machines 315, 358, 374

F

Fabrics, Manufacture of plain and figured 11
Fabrics, Bleached 35
Fan Blower 315, 390
Fans, Exhaust 323
Faucets 219 (3cl.), 259
Fellies, Bending 350
Felly Machine 35, 283
Fences 11, 75, 99, 259, 267, 315, 358
Fence Posts 374
File or Bill Holder 267, 390
Files or Rasps 35
Filters 147
Fires, Extinguishing 227
Fire Places, Metallic 366
Fire Box for Locomotives 383
Fire Escape 259 (2 cl.)
Fire Arms 91, 147, 187 (2 cl.), 267 (2 cl.)) 291, 342 (3cl.), 358, 383 (3cl.), 390 (3cl.
Fire Arms, Charger for 275, 342
Fire Arms, Primer for 299
Fish Hooks 251 (2cl.)
Fishing Rods, &c. 259
Flax and Hemp Breaking 3, 19 (3cl.)
Flax and Hemp Dressing 251, 284
Flax Bleaching 259 (2cl.)
Flax, Picking and cleaning 187
Flour, Drying 315
Flour Sifter and Renovator 331
Flour Barrel, Ventilated 342
Flour and bolting 366
Flocks for Felting 366
Fly Trap 259
Folding Powders 139
Footstool Frame 147
Forceps, Saw Sets 366
Forks, Manure and other 59, 131, 139,
Freeing Canal Boats from water 358
Frog Guards R.R. 343
Fruit Picker 342
Furnaces, Hot Air 131, 163, 235, 299, 358, 382, 406
Furnaces, Glass 267
Furnaces, Grate Bars for 307
Furnaces for Steam Boilers 139, 342
Furnaces, Zinc White 283
Furnaces, Utilizing Slags of 147
Furnaces for making Wrought-iron 406
Furniture, Toilet 19

G

Garments, Cutting 366
Gas Apparatus 3
Gas Generators 3
Gas Burners 187, 342
Gas Regulator 259, 331, 342 (3 cl.)
Gas Heating, &c. 259, 358
Gas Retorts 331
Gas Stoves 358
Gas Ovens, Doors for 283
Gas Lamps 251
Gates, Opening and Closing 43, 67, 171, 211 (2 cl.)
Gates Hanging 211, 291
Gates, Canal Lock 323
Gauges, Steam 366
Gauges, Slitting 259
Gauge, Carpenters' 406
Generators Steam 19, 67, 315
Generators, Wood Gas 406
Gilding and Plating 219
Glass Presses for Molding 171
Glass Molds 398
Glaziers' Points, Cutting 291
Grain, Cleaning, &c. 382
Grain, Drying 331, 343 382
Grape Frame 342
Grapnel for raising vessels 358, 366
Grates 374
Graters, Nutmeg 374
Griddles 43
Grindstone Frames 398
Grummets 319, 331
Guides for sewing on binding 131
Guitars 139, 195, 291
Guns, Magazine 35, 291, 342
Gun Locks 291, 350
Gutta Percha, Treating 307
Gutta Percha, Covering Iron with 34

H

Hair for Weaving 195
Hair Cleaning 131
Hame Fastening 390
Hammers, Mach. and Steam 59, 99 (2cl.) 171 (2cl.), 342, 107
Hammers, Trip 291
Handles of Table Knives 99
Harness, Detaching from Horses 358
Harrows 275 (2cl.) 382, 398, 412
Harvesters 3, 19, 75, 91 (2cl.) 115, 131 (2cl.), 155, 163, 203, 219, 237 (2cl.), 235 (3cl.), 259 (2cl.), 267, 299 (2cl.), 323 (2 [cl.), 342
Harvesters, Maize 412
Hasps, Trunk Lock 275
Hatches, Construction of 283
Hat Bodies 267
Hat Shapers 358
Hats Felt 383
Hats, Palm Leaf 350
Hay Knives 275
Hay Elevators 307
Head Cringle 59
Heaters 187, 275, 291
Heddles, Weavers 366
Hedge Trimmer 374
Heel Cutter 342
Hemp, Treating 299
Hen's Nest 227
Hinges 147, 155, 171, 227, 251, 283, 291, [412
Hoes, Garden and other 59, 187
Hollow Ware Molding 315
Hog Pens 413
Holder for Blinds 413
Hones 299
Hooks and Eyes 131, 307
Hoops, Splitting 203
Horses Holding Docks of 366
Horse Power 163, 275, 323, 350, 358, 366
Horse Collars 3, 179, 187
Horse Shoeing Apparatus 413
Horse Shoes 59, 131, 374
Hose 350
Hose Protector 67
Hot Water Apparatus 307
Houses for Switch Tenders 382
Hubs, Metallic 179
Hubs, Attaching to Axles 195, 398
Hubs, Turning, Boring and Mortising 35 211 283, 315
Hydrant Cap 315

I

Ice, Manufacture of 75
India Rubber 413
India Rubber, Treating 235
Ink, Printers' 3
Inkstands 358
Inkstand Covers 115
Iron, Manufacture of Sheet 27, 171
Iron Ore, Pigments from 390
Iron Ware, Annealing 27
Iron Rolling Machine 187
Iron, Coating with Brass 366
Iron Railings 275
Iron Buildings 251, 358, 390 [(2cl.)
Irregular Forms, Cutting 75, 139, 398

J & K

Jack Chains, Making 187
Kerosene Burning Fluid 343
Knitting Machine 291 (2cl.), 307 (3cl.) 345, 350, 406

L

Labels 374
Lampblack House 366
Lamps 11, 35, 99, 147, 163, 390 (2cl.), 398
Lamp Chimney 323
Lamp Fastening 374
Lamp Filler 412
Lamps, Lard 412
Lanterns 358, 383, 412
Lanterns and Stoves combined 251
Lasts 227
Lasting Instruments 383
Lath Machine 195, 291, 315
Lathing Buildings 382
Lathes 179, 203, 211, 259, 291, 299, 315,
Lathes Carrier for 203
Lathes, Cutting Screws in 139
Lathe Chuck 374
Lathes, Tool Rest for 406
Lathe Dog 291
Leather, Splitting 3
Leather Polishing 35, 99, 139
Leather Straps, Edging &c. 3, 83
Legs, Artificial 211
Lever Ratchet 299
Life Boats 43, 91, 251
Life Preserving Buckets, &c., 51 (2cl.)
Lifting Jacks 227, 328 (3 cl.)
Lightning Rods 350, 358, 398
Likenesses in Monuments 171
Lime Kilns 179, 288
Locks 91, 179, 203, 227, 283, 342, 374, 382
Locks, Bank 406
Locomotive Tenders 299
Logs, Sawing 147, 235
Looms 11, 27, 35, 51 (4cl.), 59, 75 (3cl.), 83 (3cl.), 91, 99, 131, 139, 147, 163, 187, 323, 366, 390, 374
Looms, Temples for 75
Looms, Heddles for 211, 358
Lounges 59
Lubricator 251, 315
Lubricating Compound 374, 383

M

Machinery, Hoisting 382
Machine Cards, Cleaning 107
Magneto Electro Mach. 67, 382
Magnetic Toy 147
Malt Kilns 139
Mandrel for lining Cylinders 11
Manure Crusher and Sower 131
Manure Excavator 413
Manure Spreader 406, 412
Manure and Sand Loader 283
Marble, Imitating 299
Matches, Making 147, 243, 383
Match Frames, Filling 259
Melodeons 390
Metals, Treating 43
Metals, Punching 35
Metals, Planing 3
Metals, Plating 358
Metals, Galvanizing 307
Metals, Grinding &c., 3
Metals Coating 67, 291
Metal Castings, Molding 342
Metal, Attaching Matter to 91
Metal, Uniting Plates of 382
Metal, Cutting and Bending Sheet 3 (2cl.), 115, 235
Metal, Plate Corrugating 195, 243
Metallic Bars, Cutter for 375
Metallic Eyes of Heddles for Looms 406
Meter Fluid 67
Milk Strainer 350
Milk Stool Frame 3
Milkers' Protector 275
Mills 315 (3cl.), 323, 342 (3 cl.), 374
Mills, Grinding 163, 251, 291, 307, 315 (2cl.), 342, 358
Mills, Hominy 406
Mills Grain 406
Millstones Dressing 91
Mincing Metal 55
Miniature Cases 171
Mitre Box 291, 342
Mop Head 83
Mortising Machine 147, 163, 349, 374, 382
Mortising Chisel 147
Moth Killer 315
Motion, Producing 331
Motors 19
Molds for Earthen Vessels 383
Molding-turning, Spiral 35
Molding Machine Cutter Head for 11, 107
Mowing Machine 374
Mules for Spinning 358
Musical Scale 75
Musical Instruments 275, 331

N

Nails, Cut 382
Nail Machine 331, 412
Nail Plate Feeder 323
Names on Paper, to print 315
Nets for Anglers 259
Nipper Blocks 307
Nippers for Presses 237
Nozzles to Pipes for Locomotives 219
Nut Crackers 3
Nut Machine 91, 179

O

Oar Locks 195
Obstetrical Supporters 319
Odometers, Car 323
Oil, Rosin 275
Oil, Parrafine 27
Oil Presses 91, 358
Oil, Purifying 350
Oilers for Machinery 267
Oil Cup for Steam Engines 147, 235
Omnibus Register 179, 331
Omnibus Step Protector 374
Ores Washing 99
Ores Stamping 350
Ores, Pulverizing 203
Organs 203
Ovens 406
Ovens Elevated 358
Oysters, Cooking 259
Oysters, Opening 259
Oyster Knife 259

P

Paddle Wheels, 3, 83, 139, 147, 315, 350, 374, 382
Padlocks 331
Paint 331 (2cl.), 366
Palliasses 299
Paper, Cane Fiber 343
Paper Cutting 383
Paper from Wood 203
Paper Feeder 267 (2 cl.), 342
Paper Files 3
Paper Wetting 163, 319
Paper, Thick 187, 383
Parti-Coloring Machine 195
Pavements, Wooden 390
Pavements, Foundations for 358
Pavement Washer 406
Pasteboard 328
Pens 67, 131, 171, 331, 382
Pen Holders 107
Pen and Pencil Case 67, 358
Percussion Caps 91
Pestle and Mortar 383
Pianofortes 3, 163, 299, 251 (3 cl.) 203 (2 cl.)
Pickaxes 131
Pictures, Photographic 358 (2 cl.)
Pill Machine 155
Pipes, Hydraulic Cement 99
Pipes, Air Heating 211
Pipe Couplings, Moldings for 291
Pins, Sticking 67 (3 cl.), 139 (2 cl.)
Pins, Diaper 358
Pistons, Packing for 59, 99
Plane, Molding 412
Planing Machine 35, 83, 179, 315
Planing Knife 275
Planing Lumber 406
Planing Stones and Metals 358, 382
Plates for Polychromatic Printing 139
Plates and Slabs, Metal 163, 235
Plates, Jointing Metal 91
Plastering, Machine for 211
Plotting Instruments 51
Plows 19, 35, 43 (3 cl.), 179, 203, 219, 267, 374, 382, 398, 412 (2 cl.)
Plows, Attaching Horses to 59
Plows, Fastening of 406
Plow Beams 35
Plow Handles 179
Plow Castings, Grinding 35
Potato Digger 291, 350
Potatoes, Washing 259
Potatoes, Cutting and Planting 59
Polishing Wheel 374
Presses Cheese 406
Press, Hydraulic 383
Press, Cotton and Hay 219, 315, 390
Presses, Seal 195, 398
Presses, Power, Self-Acting 91, 299
Presses, Printing 3 (3 cl.), 203, 235, 267, 323
Printers' Forms, Locking 323
Printers' Friskets 323
Printing Blocks 219, 366
Printing Woolen Goods 331
Printing Long Napped Fabrics 398
Propellers 35, 51, 59, 75, 83, 171
Propellers, Attaching to the Driving Shaft 259
Protecting Passengers in Cars 195
Pulleys, Window Cord 195
Pumps 155 (2 cl.), 235, 243, 267, 283, 315, 342 (3 cl.), 358
Pump, Diaphragm 406
Pump, Centrifugal 406
Punches, Metal 227

Q

Quartz Crushers 139, 171, 203, 227, 323, 331, 350, 374
Quartz Pulverizer 147

R

Radiators 390
Rails, Carving &c. 67
Rails, Cutting Hand 147
Rakes 131, 291, 358 398 (2cl.)
Ram, Hydraulic 35, 211, 299, 412 (2 cl.)
Ranges, Cooking 27, 35 (2 cl.), 43, 299, 315
Range and Oven, Hot Air 398
Ratchet Catch 147
Rattan Splitting 211 (2 cl.)
Rat Traps 251 (3 cl.)
Razor Strops 19
Reeling Machinery 211
Refrigerator, Marine Engine 390
Registers 59, 83, 139
Registers, Telegraph 51
Regulators Steam Engine 331
Road Scrapers 315 342
Rollers, for Scarfing Skelps 171
Rollers, For Stamping Patterns on 131
Roofs Forming 267
Roofing Metallic 366
Rope, Laying 267, 275
Ruling Machine 139, 179

S

Saddle Trees, Harness for 406
Saddle Trees, Fastening Skirts to 412
Saddles, Harness 406
Saddle Trees 187, 323, 382
Safes 187, 227, 267
Safes, Powder Channel to Doors of, 342
Salt Evaporator 350
Salt Packing 390
Salt Kilns 283
Sashes, Balancing 406
Sash Fastener 27, 211 (2cl.) 219
Sash Bolt 195
Sash Spring 390
Sash, Balance 299
Sash Dressing 83
Sash, Marking out 283
Sash Stiles Mortising 358
Saws 227, 291 374
Saws, Stone 99, 300, 382 (2 cl.)
Saws, Wood 163, 383
Saws, Filing 315
Saws, Hanging Mill 11
Saws, Operating Mill 51
Saws, Driving Circular 43
Saws Bearings for 358
Saws, Operating 195
Saws, Banding Pulleys for 139
Saw Gummer 147
Saw Set 219, 406
Saw Teeth, Nibbing 291
Saw for Water Wheels 19
Saw Gates, Hanging 139
Saws, Grinding 412
Saw Mills 3 171, 382
Saw Mill Blocks 315
Saw Mill Carriage 283, 350
Saw Mill Dogs 413
Saw Machine 259, 358, 366, 390
Scales Platform 91 (2cl.), 374
Scouring Goods 366
Scoops, Submarine 235
Screw Nails 59
Screw Jacks 99, 283
Screw Cutting Dies 107
Screw Bolts and Nuts 139
Screw Blank Threading 315
Screws, Threading 366
Screws for Planking Ships 131
Scythes 11, 203, 219
Screens for Cleaning Grain 382
Sealing, Hermetical 366
Seats, Car 19, 267 (2cl.)
Seed Planters 19 (2cl.), 59, 99, 203 (3 cl.), 211 (3 cl.), 219 (3 cl.), 227, 235, 251 (2 cl.), 283, 315 (2 cl.), 342, 350, 374 (2 cl.), 383, 398, 412 (3 cl.)
Separators, Straw and Grain 67 (3cl.), 75 (2 cl.)
Separators, Gold 99, 147
Sewing Machine 131, 211 (4 cl.), 251 (2 cl.), 275, 283 (4 cl.), 307 (3 cl.), 342 (2 cl.), 350 358, 390, 398, 406, 412 (3 cl.)
Sewing Machines Cops for 243
Sewing Butterfly 75
Sewing Bird 179
Sewers, Ventilating 342
Shellers, Corn 412
Ship's Blocks 27, 235, 390
Ships Knees 275
Shingle Machine 3, 91, 99, 131, 211, 235, 291
Shirt Collar 374
Shoe Horns 382
Shoes, Stretching 258
Shot Pouches 382
Shovel Handles 219, 358
Shovel and Tongs 163
Shovels and Spades 59, 83
Shower Bath 291
Shutter Fastener 59, 75
Shuttles 131
Side Lights for Ships 59
Slat Machine 35
Slate Frame 331
Slotting Machine 375
Smoothing Irons 147 (2 cl.), 291 (3 cl.), 227, 390
Smut Machines 27 (2 cl.), 35, 187, 219, 235, 299 342
Snow Plows 203
Soap 107, 323 (2 cl.)
Soda Fountain 59, 131, 374
Sofa Beds 51, 315, 350, 390
Soundings, Taking Deep Sea 315
Spades, Ditching 374
Spark Arrester 59, 323 (2 cl.)
Spark Consumer 35
Spark Burner, 107
Speeders, Stop Motion of 390
Speeders, 412
Spirit Level 412
Spike Machine 219, 350
Splints, Surgical 291
Spokes Dressing 139, 227
Spoke Machine 323, 412
Springs, Car 259
Springs, India Rubber and Steel 99
Springs, Carriage 67, 366
Spring and Catch for Doors 374
Stands, Reading and Writing 250, 374
Staples, Securing to Walls 374
Staves, Dressing 83 (2 cl.)
Staves, Jointing 35, 227, 235
Stave Machine 307, 412 (2 cl.)
Steam Controlling 187
Steam for Heating 331
Steel from the Ore 366
Steering Apparatus 51, 323
Stereotype Pans 235
Stereoscopes 358
Stiles 323
Stone Dressing Machine 59, 219, 227, 350, 374, 390
Stone Drilling Machine 211, 219
Stone Picking Machine 195
Stones, Securing in Foundations 267
Stop Cocks 35, 219
Stoppers, Chain Cable 243 (2 cl.), 323
Stoves 3 (4 cl.), 27 (2 cl.), 35 (6 cl.), 59, 67, 75 (2 cl.), 99, 131 (3 cl.), 147, 155, 163 (3 cl.), 171 (3 cl.), 187 (3 cl.), 195, 227, 235 (3 cl.), 259, 267 (4 cl.), 275 (2 cl.), 299 (3 cl.), 323, 358 (3 cl.), 390 (4 cl.), 398, 412
Stoves, Damper for 83, 315
Stoves, Regulator for 374
Stove Panel Ornament 219
Straw Cutters 3 (2 cl.), 35, 43, 75, 83, 139, 163, 275, 311, 412
Street Cleaning Machine 315
Stuffing Boxes 147
Sulphuric Acid, Manufacture of 323
Suspender Ends 342
Switches, R.R. 27, 35 211
Swivel Watch Chain 331
Syringes 107, 243

T

Table and Chair Combined 243
Table Tops, Jointing 131
Table Leaves, Supporting 99
Table Bank Note 203
Table for Ships' Cabins 291
Tailors' Measures 259
Tallow, Hardening 323
Tanning Apparatus 323, 366
Tea and Coffee Pot 311, 251, 350
Teeth, Plates for Artificial 51, 275
Teeth, Clover Hulling Cylinder 75
Telegraphs 107
Telegraph Wires Insulating 323
Telegraph Wires, Coating 323, 406
Tenon Machine 413
Tenons, Cutting Round 374
Thimbles for Stove Pipes 374
Threshers 227, 323 383
Threshers and Separators 163 (3 cl.), 195
Ticket Box 259
Tickets Printing Railway 299
Time Register 131
Timber, Dressing Crooked 83, 131, 315
Timber, Dressing Ship 406
Timber, Tonguing and Grooving 275
Timber for Ships Frames 315
Timber and Rocs, Blasting 358, 390
Tin Foil 179
Tires for Wheels 382
Tires, Car Wheel 315
Tire, Bending 299
Tobacco Drying 243
Tobacco Cutting 366
Tonsil Instruments 155
Tool Handle 179, 275, 291, 331
Tops, Whistling 342
Topsails, Yard to 331
Track Cleaners 235
Track Clearers to Grass Harvesters 406
Trap for Animals 342
Trap Doors 358
Trucks Car 275, 366
Trunk Frames 131
Trusses 155
Trusses for Bridges 251
Tubes, Wrought Iron 243
Tubes, Seamless Metal 203, 315
Tubes, Steam Boiler 383
Tubes, Inhaling 342
Tuning Forks 406
Turbines 19 (3cl.), 35
Turnkeys 115
Turn Table 398
Tuyeres 139
Type, Casting 139
Type, Rubbing 227
Type, Distributing and Composing 3, 227, 291
Typographer 307

U

Umbrellas 115, 139
Umbrellas, Folding 406

V

Valve, Steam 406
Valves for Steam Boilers 11
Valves for Engines 11, 83 (3cl.), 147 (2cl), 211, 219, 323 366, 358 (2cl)
Valves for Oscillating Engines 43
Valves for Governors 147
Valves for Hydrants 115
Valves, Pump 115, 187, 323, 399
Valves, Float 147
Valves, Cock 187, 243, 331
Valves, Slide 315 412
Valves, Piston 163
Valves, Throttle 35
Valves for Musical Instruments 350
Varnish 219
Vault Covers 315, 350
Vegetable Fibers, Treating 187, 243
Vehicles 374, 382 (2cl)
Veneering 27
Veneering Press 147
Veneers Scraping and Toothing 187
Veneers, Polishing 331
Veneers, Cutting 243
Ventilators 75, 83, 91, 163, 187, 307, 323, 358 (2cl), 390
Vessels, Draughting 382
Vessels, Paying the Seams of 211
Vessels, Protecting Bulwarks of 67
Violins 75, 375
Vine, Training the 243
Vinous Fermenting 267
Vise, Photographic Plate 155
Vises 383
Vulcanizing Caoutchouc Compounds 131, 203, 243 (2cl)

W

Wagons, Tail-board of 398
Wagons, Running Gear of 139
Wagons, Attaching Shafts to 75, 99, 163
Washing Machines 43, 75, 163, 366, 413
Wash Boards 147, 350, 382
Washer, Gold 35, 67
Watch Hands, Punching 398
Water Wheels 91, 107, 243, 250, 267, 291, 307, 358 (2cl), 374
Water Gauge 171
Water Closet 211
Water Wheel Gates 243, 342
Water Pipes, Connecting 358
Weaving Cut File Fabric 315
Wedge Machine 267
Weighing Grain 131
Well Curbs 398
Wheels and Tracks 315
Wheels, Locomotives 299
Wheels, R. R. Car 27, 35 (2 cl.), 67, 115, 227, 235, 267, 307, 323, 331, 350, 358, 382
Wheels, Securing to Axles 315
Whiffletrees 315
Whiffletrees Hooks 195
Wickets in Canal Gates 323
Windows, R. R. Car 398
Windows, Tightening 323
Windmill 299, 366 412
Windmill Sails 412
Winnowers 11, 43, 59, 179 (2cl.), 243, 323, 331, 342, 383
Winnowers, Shoes for 43, 131
Winnowers, Screens for 75
Wire Screws 195
Wire Netting 243
Wood, Reducing to Slivers 283
Wool, Combing 291, 398
Wool, Spinning 323
Wrenches, Screw 227, 350, 358

Y & Z

Yarn, Winding 398
Yarn, Spool'ng 195
Yarn, Warping and Dressing 382
Yokes, Neck 307
Yokes, Ox 59, 291 (2 cl.)
Zinc White, Making 235
Zinc White Furnaces for 235